ENGINEERING NEWS-RECORD

Waterborne contractor builds lock fast p. 28

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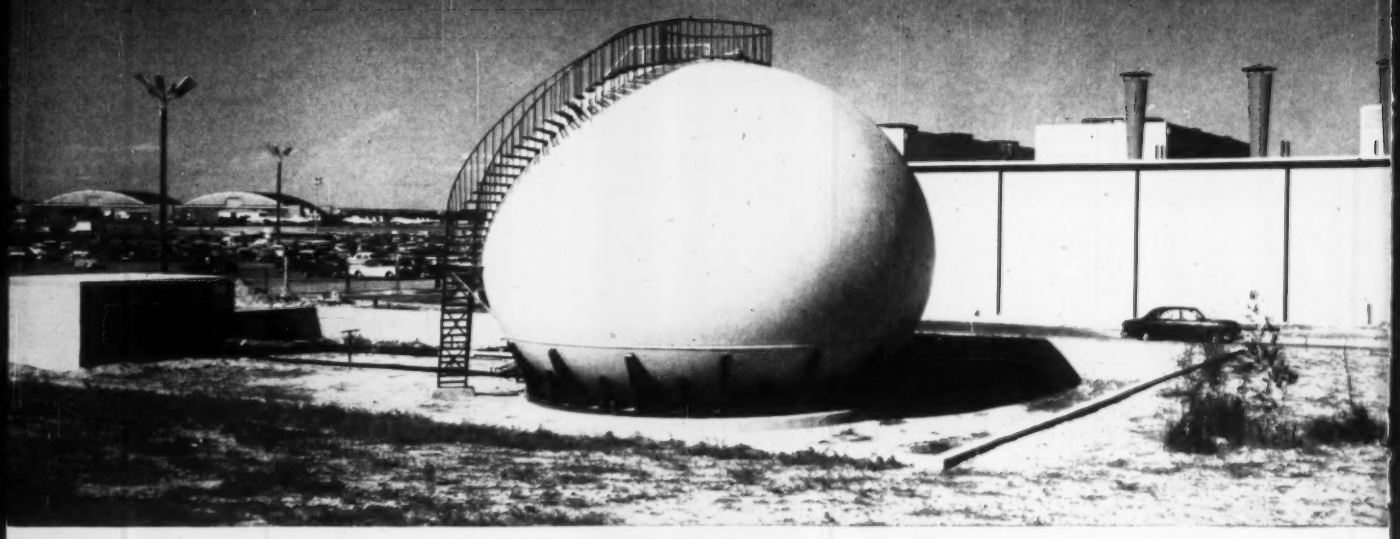
At Idlewild International Airport

HORTONSPHEROID

stores fuel for $6,000,000 heating system



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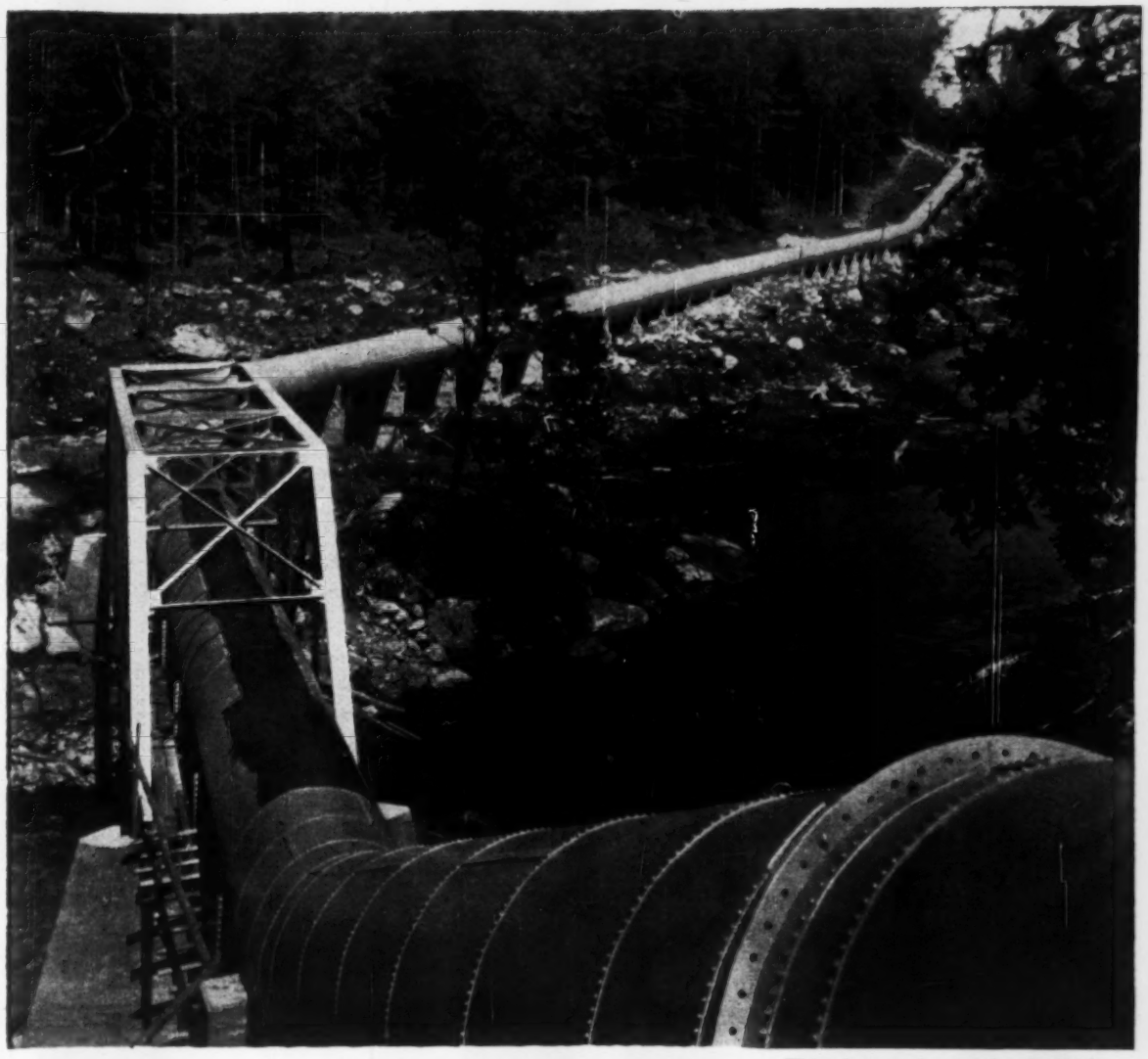

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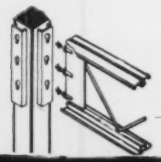

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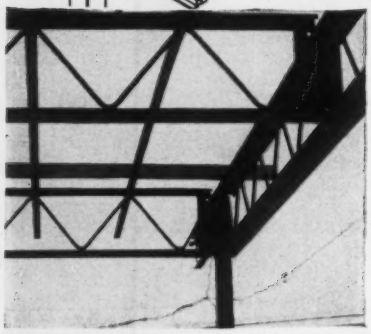
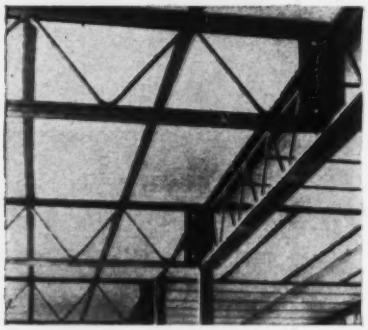
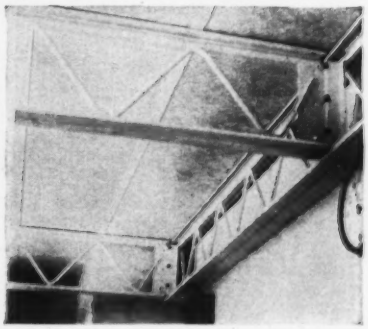


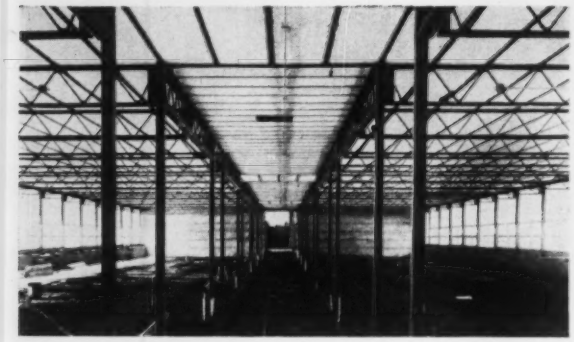
Steel framing with the Macomber V-LOK interlocking system means no on-the-job bolting, riveting or welding. Entire frame is erected in a few short days after steel delivery.



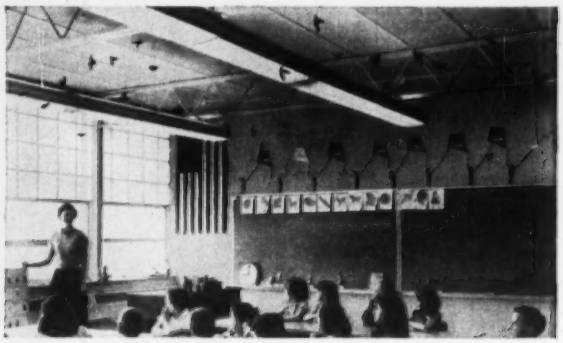
Under roof in just a few days more. Masonry and inside work can proceed without delay, regardless of weather. Nailable top and bottom chords are adaptable to any type roof or ceiling.



Finished classrooms are ready for occupancy months sooner than with other framing systems. Uniformity and attractive design of members makes lower, exposed ceilings possible.

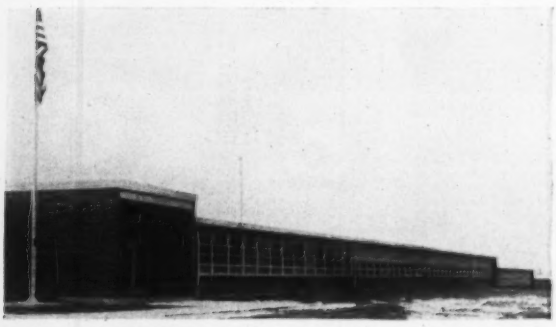


Modular bay sizes are available for classrooms, corridors, offices, boiler rooms, cafeterias, auditoriums, etc.—to fit any architectural layout. System represents a substantial reduction in weight and erection cost per square foot.



Complete architectural freedom as to finish, interior arrangement, mechanical and electrical layouts and closure materials is allowed by V-LOK construction.

This addition to Five Points Elementary School, Fairborn, Ohio—24 classrooms, 41,000 square feet, is all V-LOK construction. *Architect,* Walker, Norwick and Associates, Dayton. *Contractor,* James I. Barnes, Springfield.



Completed building of original portion of Five Points School erected two years ago—20 classrooms, 28,000 square feet—with V-LOK framing. By duplicating plans for the addition, completion time and in-place costs were reduced.

V-LOK Design Manual is available.

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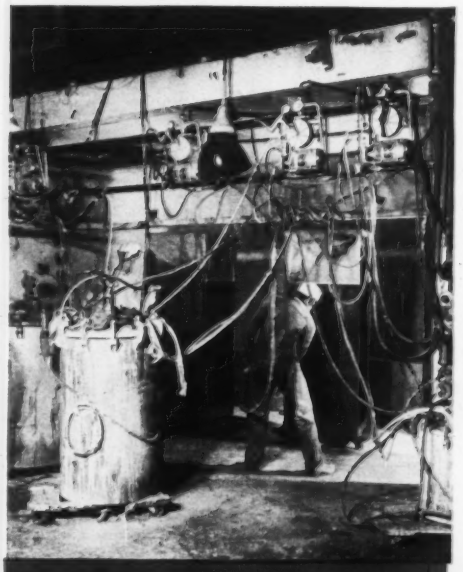
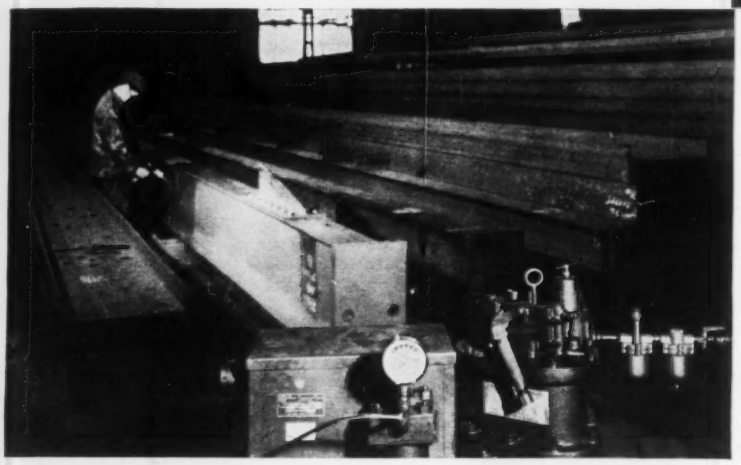


Tousey offers 2



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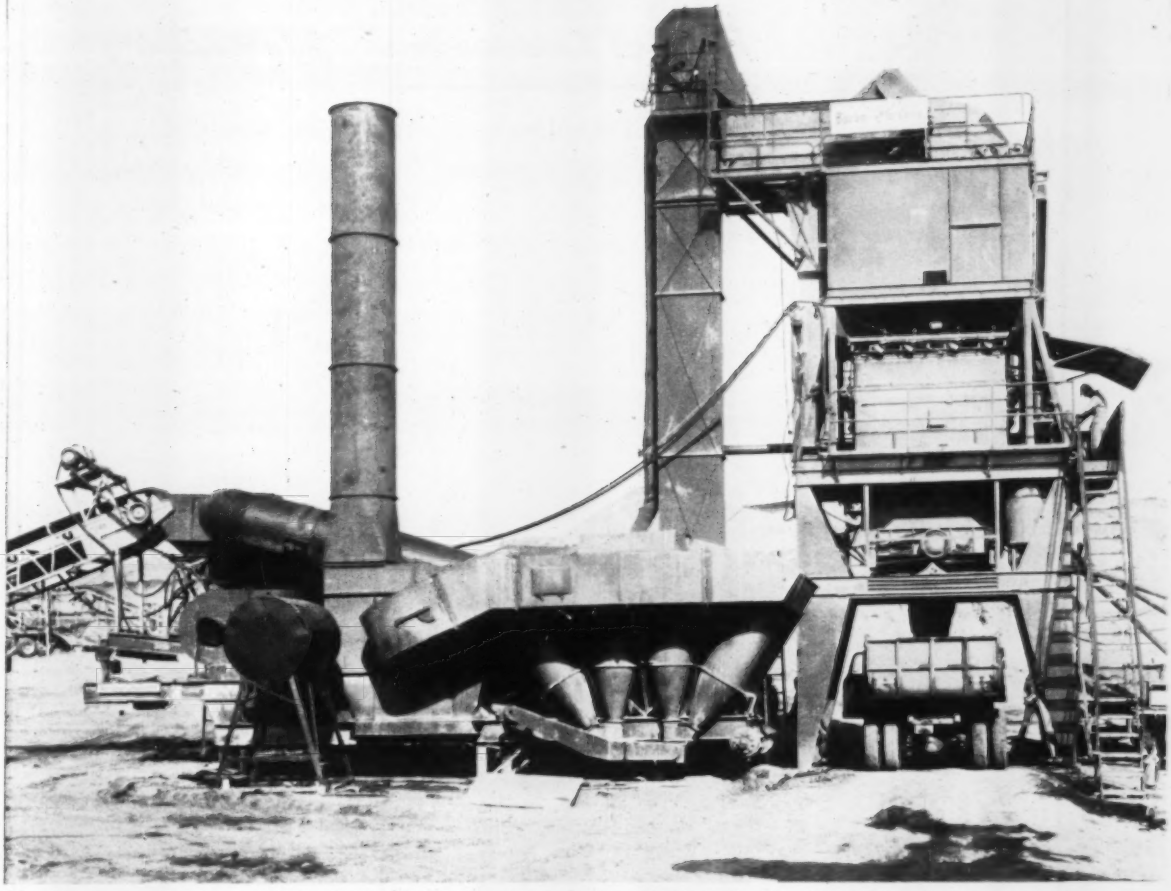

San Ore Construction Company's 6000-pound Barber-Greene Model 896 BatchOmatic, which has been set up at four widely scattered job-sites. Write for your copy of clearly illustrated *Principles of the BatchOmatic.*

Fast, low-cost moving... another BatchOmatic advantage

In its relatively short life this 6000-pound Barber-Greene BatchOmatic has worked on four widely scattered paving jobs. The fact that San Ore Construction Company could move this plant over the highway for these jobs is proof of the superior portability of the BatchOmatic.

The plant was initially set up at Caldwell, Kansas, where it produced mix for Sections 1 and 2 of the Kansas Turnpike. It was then moved about 200 miles to Ellsworth, Kansas, for another road project. The next and longest hop was about 500 miles to Fairplay, Colorado, for paving the upstream face of Montgomery Dam, a job that totaled only 20,000 tons. Its final move of the season was about 100 miles to Fountain, Colorado, for a highway resurfacing project.

Besides their unmatched portability, Barber-Greene BatchOmatics offer:

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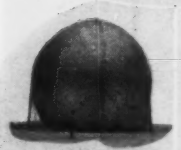
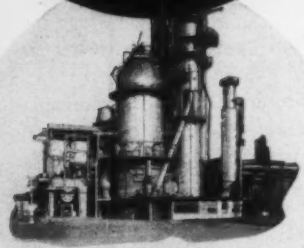


SPHERES FOR GAS AND LIQUID STORAGE

WATER RESERVOIRS ELEVATED TANKS STANDPIPES

and
STEEL PLATE FABRICATION



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Reader Comment

An Author Replies

SIR—In your issue of December 19, 1957 you published four letters regarding my article entitled "What Happens When Hammer Hits Pile" (ENR Sept. 5, p. 46) which discussed pile calculations made by means of a numerical solution of the wave equation. I would like to comment briefly on these letters.

Mr. W. H. McTigue suggested the use of an analog instead of a digital computer. This is a possibility. Digital computers are usually considered to be more accurate than analog computers; but now that we have a digital method available it would be possible to compare analog and digital results as a check on accuracy.

Mr. Marvin Gates, who has proposed his own pile formula, wrote that I made the assumption that "ultimate driving resistance is equal to bearing capacity." What I actually wrote was that the ability to compute driving resistance accurately would greatly improve the engineer's position in determining the safe bearing capacity of a pile."

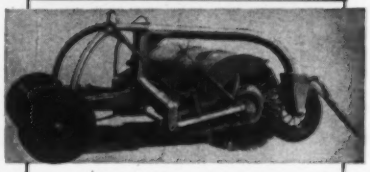
Because, for purposes of calculation, I assumed that certain piles were point bearing, Mr. Gates wrote that conventional column formulas should apply. When we assume that a pile is point bearing, we mean that the vertical frictional driving resistance of the soil is small enough to be neglected, or that we wish to neglect it for purposes of calculation. I assumed that certain piles were point bearing. Mr. Gates wrote that conventional column formulas should apply. When we assume that a driving resistance of the soil is small enough to be neglected, or that we wish to neglect it for purposes calculation. Seldom is a pile completely unsupported laterally at the instant of final point penetration. Of course, the part that is unsupported laterally must be later figured as a column forming part of the final structure.

Mr. Gates objected to the fact that, with an assumed factor of safety of 3, the wave equation gave less conservative results for certain cases than did the Hiley, Gates or Pacific Coast formulas.

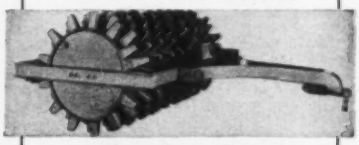
(*Reader Comment continued on p. 12*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 300 W. 42nd St., New York 36, N. Y.

Grace
ASPHALT AND COMPACTION EQUIPMENT

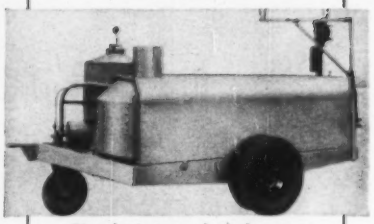


Roadsweepers, traction, engine-driven or tractor-mounted

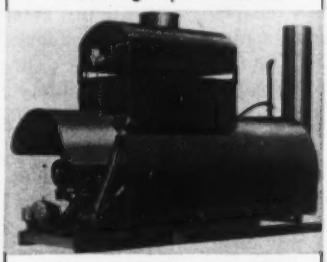


Sheepsfoot rollers

Chip spreaders



Circulating asphalt heaters



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Pneumatic rollers, self-propelled or trailed

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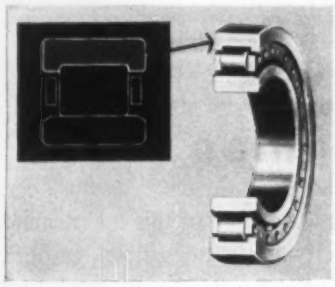

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Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability—keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

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One set of spare parts serves all these 18 HERCULES engines

Here's parts interchangeability to warm a maintenance man's heart! Hercules designed the new DD diesel and GO gasoline engines with the user in mind: succeeded in achieving a unique degree of interchangeability that reduces spare parts requirements for Hercules-powered equipment to a minimum.

Actually, the illustration above doesn't tell the whole story. To do that, we'd have to show 6 power units as well as all 18 models of 3, 4, and 6-cylinder engines available in the DD and GO series—a total of 24 power plants using many of the same wearing parts!

You can take advantage of this maintenance economy by specifying Hercules diesel, gasoline, or LP-gas power for the equipment you buy. If you'd like the full story on these modern engines, write Hercules Motors Corp., Canton 2, Ohio—or call your Hercules distributor: there's one in the Hercules worldwide network near you.

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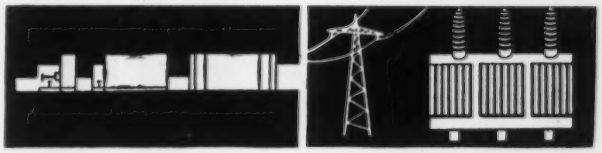
Canton, Ohio

75 years AEG



The trade mark "AEG", the significant abbreviation of

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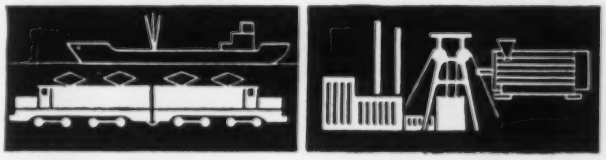
is today one of the best known signs of quality in the electrical engineering field.

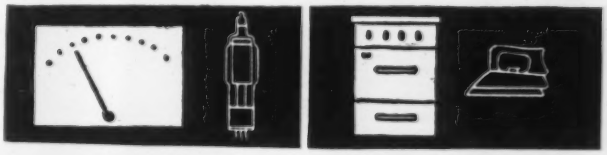
The AEG was founded 75 years ago under the title "Deutsche Edison-Gesellschaft". At all stages of its development, from the modest beginning on April 19, 1883 to the present giant undertaking, growth was supported by a chain of important contributions to electrical engineering science. Our production programme ranges from the smallest domestic appliance to the largest power station and is handled in 18 modern factories and numerous planning departments.



From the very start the company has fostered relations with other countries. Today there are representatives or distributors in nearly every country of the world.

75 years of endeavour have endowed us with an immense sum total of experience. This experience guarantees a high quality of production at all times and forms a sound basis for further progress. AEG products are known and esteemed everywhere.

The 75 years of AEG history put us under an obligation to continue rendering faithful service to our millions of home and overseas customers.



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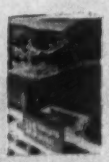

. . . Reader Comment

At present, I am not prepared to say that a factor of safety of 3 is always the desirable one. However, a method of computation that takes accurate account of the differences between various types of piles can operate with a lower factor of safety than a formula, such as the Gates, which assigns the same load to all piles driven to the same number of blows per inch, regardless of weight, length, or material composing them.

Since my paper was published a number of calculations have been made in which part of the ultimate driving resistance was distributed along the length of the pile, both uniformly and also with triangular distribution. These calculations have given more penetration per blow than obtained in comparable calculations in which all resistance was assumed to be at the point. We may conclude, tentatively, that the assumption that all resistance is at the point is the conservative assumption when using the wave equation.

Mr. Focht's letter has been, to a large extent, answered above. I might add that what I am offering is a mathematical method of computation and not merely "another pile formula."

Mr. D. H. Lee wrote from England and suggested that credit should also be given to W. H. Glanville, G. Grime and W. W. Davis of England for applying the wave equation to pile driving in 1935. I concur fully. A classic paper prepared by them in 1938 in collaboration with E. N. Fox was published by the British Department of Scientific and Industrial Research as Building Research Paper No. 20 entitled "An investigation of the Stresses in Reinforced Concrete Piles during Driving." This paper presented strain gage experimental evidence to show that piles acted in general accord with the wave equation, and also offered a wave equation solution. However, these gentlemen were handicapped by the lack of modern electronic computers, and were therefore forced to include the simplifying assumption that the ground acted as a spring, whereas actually the ground has elastic-plastic characteristics.

Anyone who wishes to study the details of applying the wave equation and electronic digital computers to pile calculations, can obtain from me a reprint of a paper entitled "Impact and Longitudinal Wave Transmission" which I presented at a meeting of the American Society of Mechanical Engineers, and which was published in their Transactions of August 1955.

EDWARD A. SMITH
Chief Mechanical Engineer
Raymond Concrete Pile Company

(Reader Comment continued on p. 15)

Another **DIETZ** development

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604 SUPER Visi-flash®

HIGHWAY HAZARD WARNING

3 TIMES BRIGHTER

Two-way polished aluminum reflectors plus combination bulls-eye and prism lens concentrate and greatly reinforce brilliance.

Transistorized circuit provides non-mechanical make-and-break, greater durability, dependability and 1500 hours battery life.

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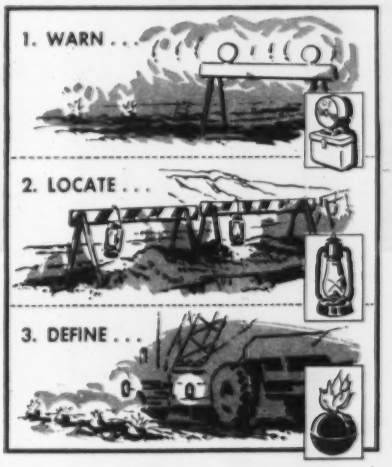
You've asked for it . . . a highway flasher of greater brilliance. And here it is . . . this amazingly more effective version of the tried-and-proven Dietz Visi-Flash . . . the new 604. Same rugged construction! Same size batteries! But LABORATORY PROVED 3 TIMES BRIGHTER than any other barricade flasher. Three times more warning power . . . to jar drivers fully alert and focused for danger.

Intensely brighter flashes carry farther. Light and dark periods so scientifically timed that the flashes are seen as sharp, meaningful warnings. FLASH – darkness – FLASH – darkness – FLASH! An unmistakable warning signal.

DESIGNED TO WARN WITH MAXIMUM EFFECTIVENESS

As a good warning flasher should, the 604 Visi-Flash concentrates the light in a full-faced brilliant beam that is highly visible over the entire width of the road, and is double faced to give protection from either direction.



Adequate lighting may save you thousands in tragedies, bad publicity and law suits. Write for latest authoritative manual on Hazard Warning Lighting. R. E. Dietz Co., 100 Leavenworth Ave., Syracuse, N. Y.

● For adequate safety, hazard warnings should (1) **WARN** of approaching danger by use of flashers and torches; (2) **LOCATE** the hazard by means of lanterns and (3) **DEFINE** and illuminate hazard with torches and lanterns.

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Why not use a simplified way of guarding your equipment against improper lubrication that causes unnecessary breakdowns?

All you need is Mobil's easy-to-follow Contractor PM System—a practical program that's specially designed to help reduce your paper work, help keep your equipment in top working order—and these important Mobil lubrication aids:

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Lubrication Engineering Service that includes analysis, advice and use of Mobil's outstanding technical know-how and show-how.

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1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
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3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

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Bench Drilling on Angle

SIR—After reading "Stornorrfors: Milestone in Rockmoving" by T. Goransson (ENR Jan. 30, p. 38), I am puzzled as to why the bench drilling rigs are inclined on a 26-deg angle. It would seem the rock-wise Swedes are throwing away 3 ft of every borehole, since at the angle mentioned holes 28 ft deep are required to pull 25 ft of depth, even where no overdrilling is required.

Also, it has been my experience that slanting holes are more difficult to clean and have a greater tendency to curve than do vertical holes.

JOHN R. ROSS
General Manager
Blasting Service, Inc.
Rochester, Mich.

•

SIR—The 26 deg bench drilling angle has nothing to do with the composition of the rock or limited head room for steel changes. We have found it necessary to drill at this angle to have the rock thrown up at the blasting. Otherwise, the rock would stay at the bottom.

T. GORANSSON
Luossavaara-Kiirunavaara A. B.
Kiruna, Sweden

Supervision by Consultants

SIR—Your article, "Construction Supervision: Consultants Look for More of It" (ENR Mar. 6, p. 25) was of great interest to me.

I, too, feel that supervision by the engineer is very important, since most of my work is of a structural nature including foundation design, under-pinning and shoring design, and general structural work in connection with buildings. Supervising such work helps to guarantee the owner against errors during construction.

Clients previously have been reluctant to assume the additional fee for such supervision, but the facts show a tendency to accepting it is becoming more prevalent.

GUSTAVE M. GOLDSMITH
Consulting Engineer
Cincinnati, Ohio

CALENDAR

American Water Works Association, annual conference, Memorial Auditorium, Dallas, Tex., April 20-25, 1958.

Southern Municipal and Industrial Waste Conference, 7th annual meeting Duke University, Durham, N. C. May 1-2.

Consulting Engineers Council, Second Annual Board of Directors Meeting, Sir Francis Drake Hotel, San Francisco, May 1-3.

Purdue Industrial Waste Conference, 13th annual meeting, Purdue Memorial Union Building, Lafayette, Ind., May 5-7.

You'll find many cost-cutting ideas in this new booklet—

THIS FREE BOOKLET shows you how many jobs a single "PAYLOADER" tractor-shovel can do with its wide selection of interchangeable attachments — it demonstrates how one basic machine, with a wide assortment of tools, can handle any type of bulk material, can trench and excavate, install pipe, backfill, spread blacktop and even sweep streets and plow snow.

Only a "PAYLOADER" can do all of these things because no other tractor-shovel comes close to providing as many useful, work-saving and money-saving attachments. The special booklet has been prepared to help you visualize this great "PAYLOADER" versatility. It contains specifications and action pictures of the attachments at work. A copy is yours for the writing. The Frank G. Hough Co., 772 Sunnyside Ave., Libertyville, Ill.

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Low cost operation

Whether it be shining shoes, or a multi-million dollar industry, operational costs can spell the difference between success and failure. That is why so many government agencies, municipalities, private water companies, and industries have turned to LOCK JOINT CONCRETE PRESSURE PIPE.

The dense walls of Lock Joint Concrete Pressure Pipe resist electrolysis and soil corrosion. They also protect steel reinforcing of such conservative stress design that danger of bursting is virtually negligible. Result: replacement or even repair is a rarity, and danger of sudden failure which often entails extensive damage is held to a minimum.

Smooth concrete inner surfaces which cannot tuberculate make the pipe's initial high carrying capacity permanent. Result: low pumping costs and full capacity in the future when even greater demands may be made on the line.

Long life, permanent high carrying capacity and minimal maintenance represent highest quality service at lowest operational cost. This measure of a successful water works system can be yours with LOCK JOINT CONCRETE PRESSURE PIPE.

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ENGINEERING NEWS-RECORD

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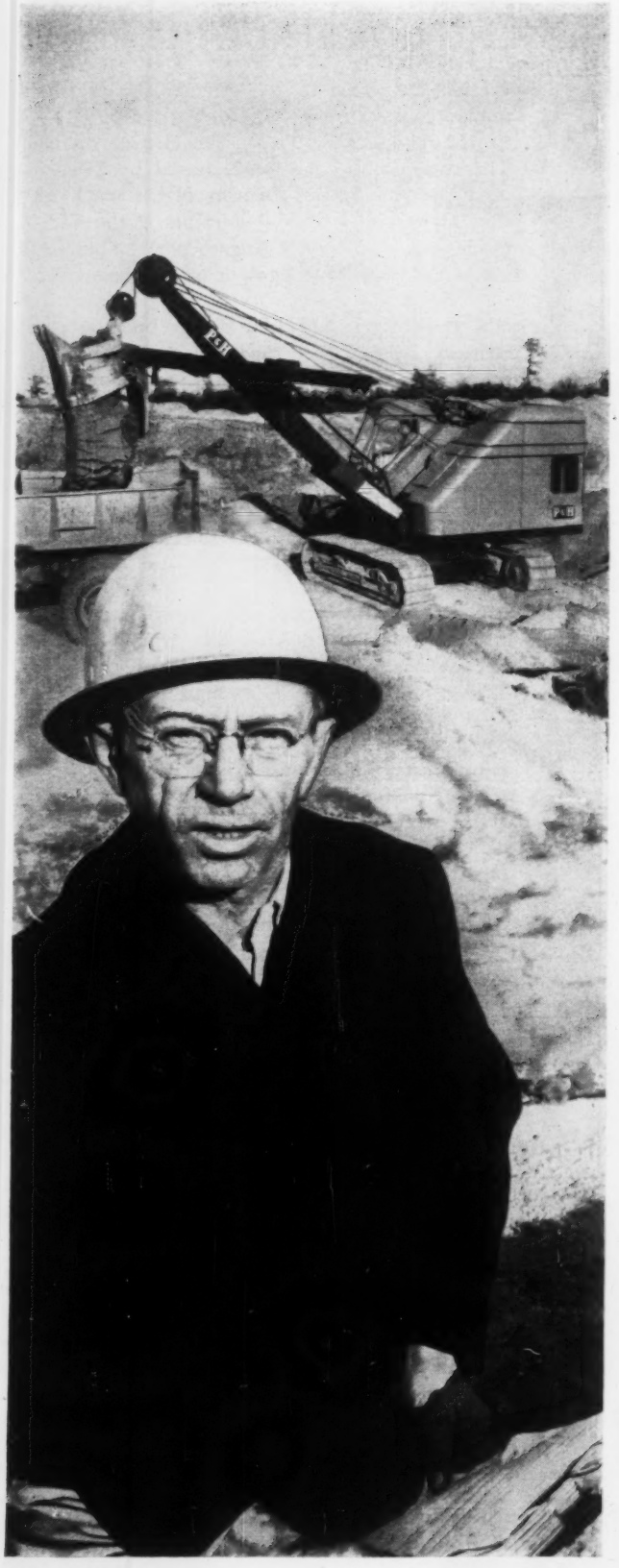
THE CONSTRUCTION WEEK

BIG ORDER—The U. S. Army has awarded a $12 million contract for 400 truck-mounted power shovels to the Quick-Way Truck Shovel Co. of Denver. The contract also can be increased by 25% at the option of the Army. Delivery of the machines will start in January 1959 and continue at the rate of 20 machines a month until August 1960. The machines are being prepared to work at 65 deg below zero.

APPR II REVEALED—In a private opening attended only by U. S. Army Engineers and representatives of the bidding firms, Peter Kiewit Sons' Co. of Omaha, Neb., submitted a low quotation of $4,897,000 on a contract to be negotiated for the construction of a package atomic reactor heat and power plant at Fort Greeley, Alaska. No public bid was issued; the Army Engineers' Alaska District sent plans to 10 firms for quotations. Eight of the 10, submitted proposals at a meeting in Seattle, with bids ranging up to $6,792,000. The Fort Greeley plant will be patterned after the Army Package Power Reactor I at Fort Belvoir, Va., which has been in operation since last spring. When completed in 1960, some 42 billion Btu an hour in steam and about 1,700 kw of electricity will be produced. The basic design was done by Alco Products Co., Inc., Schenectady, N. Y., builder of the Fort Belvoir plant.

PUGET SOUND BRIDGES—The Washington State Toll Bridge Authority has adopted an engineering report finding a proposed $121.4 million Puget Sound bridge system financially feasible. The report by consultants Porter, Urquhart, McCreary & O'Brien, of Newark, N. J., estimates that the project would require a bond issue of $194 million, to be repaid by tolls. The money would cover construction of a 3 mile floating bridge, a high-level suspension bridge to span 3,324 ft over a channel, two smaller bridges plus expressways and retirement of an existing $40 million bond issue for another floating bridge now under preliminary construction. Preparation of final plans will have to wait until the 1959 legislature acts on a proposed financing plan, but in the meantime some design work will be done with funds from legislative appropriations.

ANOTHER KIND OF RAIL PIGGYBACK—To permit widening of U. S. Highway 40 near Auburn, Calif., the California Division of Highways is going to pull down the piers carrying a four-span, single-track railroad crossing over the route. But just the piers—Southern Pacific needs the girders and track for traffic as usual. As the new permanent support beneath the existing 90 ft, 60 ft and two 30 ft girder spans, U. S. Steel's American Bridge Division will build a 240 ft single-span steel truss bridge. George Pollock Co. of Sacramento is the general contractor.



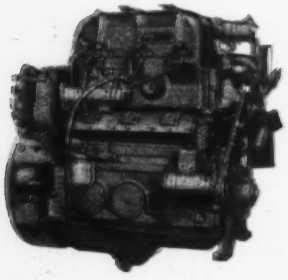
"Power to really dig in and do a day's work"

Mr. Wulf, general manager of Monmouth Trucking Company Sand and Gravel Pit, is enthusiastic about his P&H Diesel powered ¾-yard P&H 255A shovel. You hear reports like his everywhere about the P&H Diesel. It consistently makes good equipment perform better and results in less downtime for maintenance.

Until Harnischfeger developed the P&H Diesel, owners had to be satisfied with diesels which did not fully utilize all the potential of their equipment. But now, P&H Diesels have changed this situation with:

- **better response, faster starts, better idling than any other make of diesel**
- **delivers more power with less fuel—uses low-cost No. 2 diesel fuel**
- **25% fewer working parts and all wearing parts are interchangeable**
- **compact design results in easier maintenance—smaller parts stock**

For all of your equipment—including crushers, front end loaders and other portable equipment—specify the one diesel with all the features that deliver top performance—P&H Diesel. P&H Diesel Engine Division, Crystal Lake, Illinois.



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Fastest Growing Name in Diesel Power

WASHINGTON OBSERVER

- No rush to override rivers and harbors veto
- Construction spending on roads rising
- Bid prices on highways go down
- Small jobs to get big chunk of new money

● **Democrats aren't rushing to override President Eisenhower's veto of the $1.7 billion rivers and harbors authorization bill.** Reason: They have to admit the validity of the President's reasons for vetoing: (1) that it contained some $350 million of projects objectionable because they had not been approved by the Engineers or the Budget Bureau or for other reasons; (2) the bill wouldn't create any new jobs in time to be a worthwhile anti-recession measure.

But there's no doubt of the political impact of the veto. Republicans running for office this fall say they will be hurt. Senate GOP leader Knowland campaigning for governor of California—says he asked the President not to veto. Candidate Knowland is doing what others are doing: cutting himself loose from the President on issues that hurt. He says he's counting on the voters' remembering his 25 year record in favor of water resource development.

—

● **Construction spending on all U. S. roads should hit $5.3 billion this year** according to latest estimates of the American Road Builders Association. That's an increase of $300 million—about 6% over last August's rate.

Calendar 1959 on-site spending should rise to $6 billion, which would be a 13% rise. These figures are directly attributable to the impact of the new highway law which President Eisenhower signed last week.

—

● **Congressmen will be glad to hear that bid prices on highway jobs are declining.** The decline is small, but the trend is significant. The latest figures on the Bureau of Public Roads' composite mile index show a drop of 2% since the third quarter of last year.

The downward trend should continue, at least for a few more months. The number of bidders is high on all jobs, and government officials see more and more awards going at figures well below cost estimates made last fall.

—

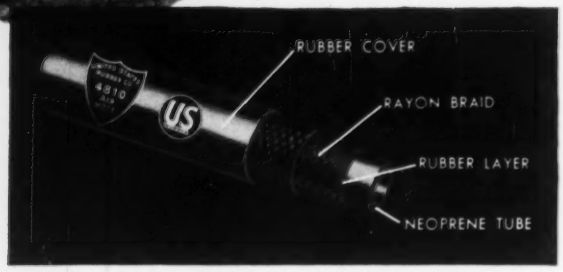
● **Latest figures on contract awards for federal-aid highways:** Of the $2.4 billion in contract awards made in 1957, 67% of the dollars went to contracts ranging upward from $500,000.

On the other hand, some 85% of the number of contract awards were for jobs ranging $500,000 or less.

The quickest spending of federal funds, of course, is on the smaller jobs. Contractors can complete these projects in a matter of a few months.

Hence smaller jobs are likely to get the bulk of the $400 million of new highway money Commerce Secretary Weeks allocated for the ABC roads. All this has to be under contract by the end of November, and the jobs have to be scheduled for completion by November 1959.

US RUBBER 4810 AIR HOSE



Where men and hose flex their muscles

Here's the hose that's as rugged as the men who use it. On the really tough construction jobs—where tight quarters, abrasive terrain and high working pressures take their toll of ordinary air hose—mandrel-made, wrapped-finish, U.S. 4810 Air Hose stands up to use *and abuse.*

Yet, despite its great strength, 4810 is no muscle-bound hose. "U.S." engineering has made it easier to handle, readily flexible, able to take higher working pressures—*and less expensive*—than the conventional air hose you might be using. It's one of a complete line of U.S. Rubber construction hose.

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Mechanical Goods Division

United States Rubber

Rockefeller Center, New York 20, N.Y.

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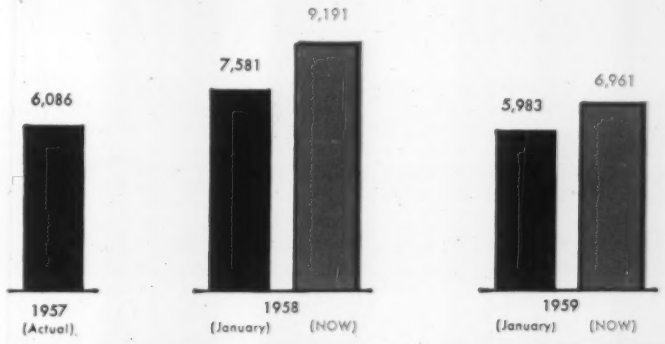
Federal funds for construction — *before and after anti-recession measures*

(in millions of $ per fiscal year for programs of highways, Army civil works, reclamation, military construction and housing)

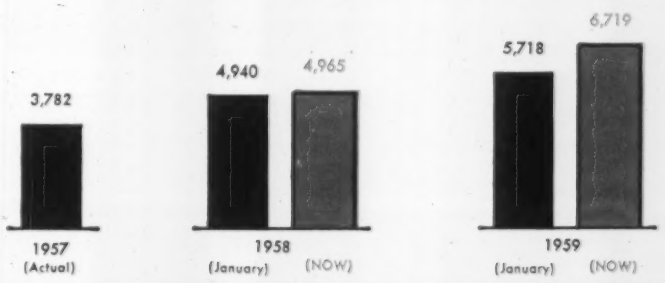
Appropriated and slated for appropriation

Differences in estimates of appropriations for fiscal '58 and '59 made in January and now indicate volume of recent anti-recession legislation.



Estimated expenditures

Actual movement of money will climb in fiscal '59. Bars for '58 don't show current second half speedup ordered by Administration after first half slowdown.



Adding Up the Anti-Recession Action

Now that most of the dust has settled from a flurry of anti-recession action by the Administration and Congress, some of the pieces involving construction can be put together.

The action revolved around two broad fronts: an Administration-ordered speedup of expenditure for an immediate effect, and bigger Congressional appropriations that will continue the higher spending rate in fiscal 1959 (beginning this July 1).

For four months now, the ponderous spending machinery of the U.S. government has been changing direction.

From an all-out drive to hold down spending for public works during the first half of fiscal '58 it has gone to an all-out drive to pump out dollars at a faster rate.

The accompanying table (see next page) shows how successful this effort is—where the spending push is getting results and where it is still lagging behind original budget goals for the current fiscal year.

The dollars have started to flow fast enough to carry totals up to or beyond the estimates of last January in all but one category. Only military construction is still lagging. Instead of $1,962 million expected in January, spending for the current year doesn't seem likely to exceed $1,786 million.

There are several ways of judging the total effect of the spending drive:

- Compared to the original budget totals for the current fiscal year, the net rise amounts to a mere $25 million. That's because increases of some $200 million in highways, Corps of Engineer projects, reclamation and housing are all but wiped out by the $176 million lag in military construction.
- Compared to spending in the preceding fiscal year, the rise is more substantial. Headed by big jumps for roads and housing, the current year seems likely to hit a public works level $1.2 billion higher than was reached in fiscal 1957.
- Perhaps the most meaningful measurement is a look at the revised spending programs in the light of the next fiscal year. Another big rise is scheduled—$1.8 billion. Add the gains of this year and next together, and a resounding $3 billion rise over fiscal 1957 is indicated.

The small amount of gain being posted for the current year over the budget estimates of last January is a disappointment to high Administration officials who have placed their bets on spending increases as the major weapon against the recession.

Their hopes are still strong, however, for increases during the rest of the present fiscal year in non-public works programs such as pay increases for government workers, extended unemploy-

. . . Adding up the anti-recession action

ment payments, and speeded-up purchase of routine supplies. Some of these depend on Congressional action.

The new Director of the Budget, Maurice H. Stans, expects all federal spending to rise $1 billion over the budget this year, most of it concentrated in the current quarter. This would take the total to around $74 billion.

• **Appropriations way up**—The appropriations side of the picture is rolling along. Here is a category by category summation:

Highways: The President signed the new highway bill last week and within 24 hours, Commerce Secretary Sinclair Weeks was speeding allocations of new money to the states—$400 million for primary and secondary roads, with contract awards to be made by December 31.

The money will not actually go out of the federal Treasury until the work is in process, and therefore will not show up as a major expenditure for months to come. But the new highway law should have an immediate impact on the construction industry.

In addition, there is $115 million in the new law for federal loans to states. States can borrow from this fund to provide their share of the new 30-70 formula, to be repaid out of future allocations.

In dollar totals, roads are by far the fastest growing federal public works program in the country. From expenditures of $953 million in fiscal 1957, it is expected to jump to $2,675 million in fiscal 1959.

Housing: Federal funds for housing will score the second greatest advance if the hopes of backers of the new housing bill are realized. The big rise is expected from a $1 billion authorization for the Federal National Mortgage Association (Fannie Mae) to buy Veterans Administration and FHA mortgages at par, up to $13,500 per mortgage. At the present price of borrowing for mortgages in the private market, this is certain to attract builders. With prevailing discounts on VA mortgages, for example, a builder in some parts of the West would be able to get only $92.50 per $100 of face value of the mortgage. Under the new housing act, he will be able to present the mortgage to Fannie Mae and get $98.50 per $100.

Housing authorities expect to commit $300 million of the $1 billion sum between now and June 30. At that time, they'll take a look at the situation and see whether the program should be slowed down.

The heavy impact of mortgage purchasing will not be felt by the Treasury until the new fiscal year, when a rise of $480 million in housing expenditures is expected.

Water Resources, Military: Smaller increases between Fiscal 1957 and 1959 are posted for Corps of Engineers and Bureau of Reclamation water resources programs. And even slow-moving military public works are in for a modest 9% rise, once the last remaining effects of the economy drive are shaken off.

Even more spending may result from the anti-recession activities of Congress. The community facilities program sponsored by Sen. J. William Fulbright was passed by the Senate last week in a surprisingly lop-sided vote. The bill provides $1 billion for loans to municipalities at 3½% interest. It was opposed by Republicans and a few conservative Democrats in early Senate tests but when the showdown came, GOP lawmakers stampeded to support the measure. It has a good chance of passing the House. However, Republican leaders have warned that it is likely to draw a veto by the President.

Federal Public Works Funds

Appropriated or Slated for Appropriation (in millions)

Fiscal Year:	1957	1958 Estimated as of:		1959 Estimated as of:	
Program	Actual	Jan. 1958	Now	Jan. 1958	Now
Highways, Federal-aid allocations to states	$2,000	$2,550	$2,550	$2,875	$3,475
Army civil works	639	645	645	628	753
Reclamation	198	194	204	202	269
Pollution control	50	45	45	45	45
Military construction	1,462	2,067	2,068	1,576	1,702
Housing, federal funds only	1,787	2,125	3,725	702	762

Expended and Estimated for Expenditure (in millions)

Fiscal Year:	1957	1958 Estimated as of:		1959 Estimated as of:	
Program	Actual	Jan. 1958	Now	Jan. 1958	Now
Highways, Federal-aid allocations to states	$953	$1,752	$1,869	$2,326	$2,675
Army civil works	610	630	685	665	775
Reclamation	171	199	208	216	235
Military construction	1,959	1,962	1,786	2,104	2,137
Housing, federal funds only	89	397	417	407	897

Machinery Men Worry

Business talk, not design, features SAE conference

In an atmosphere charged with emotions varying from cautious optimism to despairing resignation, the Central Illinois Section of the Society of Automotive Engineers last week held its Ninth Earthmoving Industry Conference at Peoria, Ill.

More than 1,500 men concerned with the development, design and manufacture of earthmoving equipment heard 11 speakers discuss topics ranging from the fabrication of high strength alloy steels to the difficulties of construction in Antarctica. Outside the technical sessions, however, the talk was more about how to sell what was already designed than how to improve future designs.

The announcement at the final meeting that the President had signed the highway bill and the almost simultaneous announcement that Caterpillar Tractor Co. had received a $7.8 million government order prompted considerable optimism for the long-range picture, but the majority of those present felt that conditions will get worse before they improve.

Harmon S. Eberhard, president of the Caterpillar Tractor Co., in a statement to a local newspaper, expressed the opinion that the principal impact of the legislation will not be felt until next year. He said, in part, "We are hopeful that our sales for this year will benefit. It is too early, however, to determine the near-future effect of the new legislation on either sales or employment."

Other Caterpillar officials announced that a layoff of 2,100 employees scheduled for next week will be made as planned. The firm already has reduced its force by 6,000 and the continuation of the trend by Caterpillar and other equipment manufacturers was the big worry.

In spite of the economic cloud overshadowing the meeting, attendance at the technical sessions was heavy. One of the speakers, D. A. Armstrong, equipment superintendent for S. J. Groves & Sons Co., created a stir by admitting that in many cases he had found it advantageous to replace torque converters with standard transmissions.

He stated that overheating forced the changeover.

(Manufacturers of torque converters interviewed by ENR admitted that overheating is a problem, but they attribute it to one or two causes—either the manufacturer of the construction equipment has increased the horsepower of his unit without correspondingly increasing the size of the torque converter, or the operators of the machines are not careful about selecting the proper gear ratios for their work.

Mr. Armstrong, in presenting the contractors' design requirements, also stated that 35% of his down time is caused by failure of external parts such as sheaves, cables and hoses. To lick this problem he asked the designers to provide fully-sealed bearings in sheave assemblies, better piping systems for the transfer of air or hydraulics, better cables, and better hydraulic systems. He also cited the need for more efficient air filtration units and heavy duty electric systems.

Research a Must, Steelmen Told

If the structural steel fabricating industry expects to continue its progress and expand its prosperity, greater emphasis must be placed on improving its product through research. With this challenging statement, N. P. Hayes, president of the American Institute of Steel Construction, sounded the keynote of the AISC's tenth national engineering conference last week in St Louis. The two-day meeting presented a well-rounded, highly technical program to about 400 registrants, mainly engineer-representatives of AISC member companies.

The importance of AISC's continuing and extensive research program was crystallized in a report of current projects, by Edward R. Estes, Jr., research engineer. In keeping with its long established policy, the institute carries on the majority of its research with several mutually interested technical organizations. These include the American Iron and Steel Institute, the Association of American Railroads, other industries, colleges, the Bureau of Public Roads, the armed forces and other state and federal agencies.

• **New column formula**—One of the most significant long-range accomplishments, said Mr. Estes, is the Column Research Council's 14 year research study of columns and other compression elements in metal structures. The council has now reached the point where it will present to the engineering profession a complete summary of the acceptable methods of designing compression elements and members.

It will be submitted only as a guide to specification writers, explained Mr. Estes. It will not attempt to tell specification-writing bodies such as AISC, American Railway Engineers Association or American Association of State Highway Officials which design formulas they should use. Instead, it will point out the advantages and disadvantages of the various theories. One of the most important contributions in the guide is a general column formula applicable to all ASTM structural steels. No more difficult to use than present column formulas, it is believed to be more accurate and, in general should result in a more economical column, he said.

• **Bolted joints**—The 11-year-old research council on riveted and bolted structural joints is currently investigating the use of high strength bolts with high strength steels. It is also considering the feasibility of permitting bolts in a joint and the possibility of using regular instead of heavy nuts.

• **College research**—Several cooperative research projects are in planning or testing stages at colleges and universities. To name a few: Moment connections of long-span joists, at Virginia Polytechnic Institute; plastically designed Vierendeel trusses, at Tulane University; one-sided beam-to-column connections, at Utah University; local buckling and rotation capacity of wide-flange beams, at University of Connecticut; and prestressed steel trusses, at the Universities of Washington and Colorado.

A number of other AISC research projects deal with efficiency of riveted joints and allowable bearings on rivets in single and double shear.

• **Plastic design**—A study is getting under way at Lehigh University on the applicability of plastic design to multistory structures, said Mr. Estes, and the AISC's long-awaited manual on plastic design in steel will probably be ready for publication this fall.

Other research projects at Lehigh include one on thin-web plate girders and a study of welded beam-to-column connections. The results will be published by AISC as soon as analysis and development of suitable design rules are complete.

• **Steel bridges**—Homer Blodgett and R. A. Wilson, of the Lincoln Electric Co., discussed the economics of welded highway bridges.

In some bridge designs, they said, 25% to 33% in the weight of structural steel can be saved by welding rather than conventional fabrication. Other savings can be achieved by composite design of concrete deck and steel girders, continuous spans, better design of welds, greater use of semiautomatic welding, massproduction of welded assemblies and other improved techniques of welding that have not yet been fully explored.

Landslides Plague Palisades Highway

For the third time in two weeks, portions of Southern California's rain-drenched Pacific Palisades slid down from precarious cliff-side perches to rest more comfortably in two neat 1 ft piles across U. S. Route 101 alternate between Santa Monica Canyon and Sunset Boulevard junction.

The first of these slides, on March 27, dumped 60,000 tons of earth across the road. The next, on March 31—only a half hour before the route was to be reopened to traffic—cascaded more than 400,000 tons of sandstone at the same location to bury and kill one of the state's highway engineers, V. O. Sheff, under about 100 ft of earth. And to culminate the woes, some 17,000 tons more tumbled down the 200 ft high cliff just one mile north of the first two slides to isolate 154 families living in a trailer court.

To rebuild the stretch of coast highway will cost about $1 million, say officials of the Highway Department. The main engineering feat will be to gudle the largest slide area with a permanent four-lane highway that will rest on jetties and riprap protected embankments extending into the sea. Engineers decided this would cost less than to build a temporary bypass around the areas.

Nor do engineers want to bulldoze through the slide, since they feel it might cause a further slide: a dangerous overhang still exists.

Ice Barrier Keeps Excavation Dry

With only 10 ft to go to reach 150 ft bedrock depth as this photo was taken, the famous ice barrier (dotted line) at Gorge High Dam on the Skagit River in Washington was holding well. After the ice barrier to stop underground flow failed during the first attempt to excavate (ENR Mar. 7, 1957, p. 28), heavier refrigeration equipment was installed and the ice dam was thickened and kept at a lower temperature. Gorge High Dam is a project of Seattle City Light to replace a shorter dam just upstream.

Brussels World Fair Opens

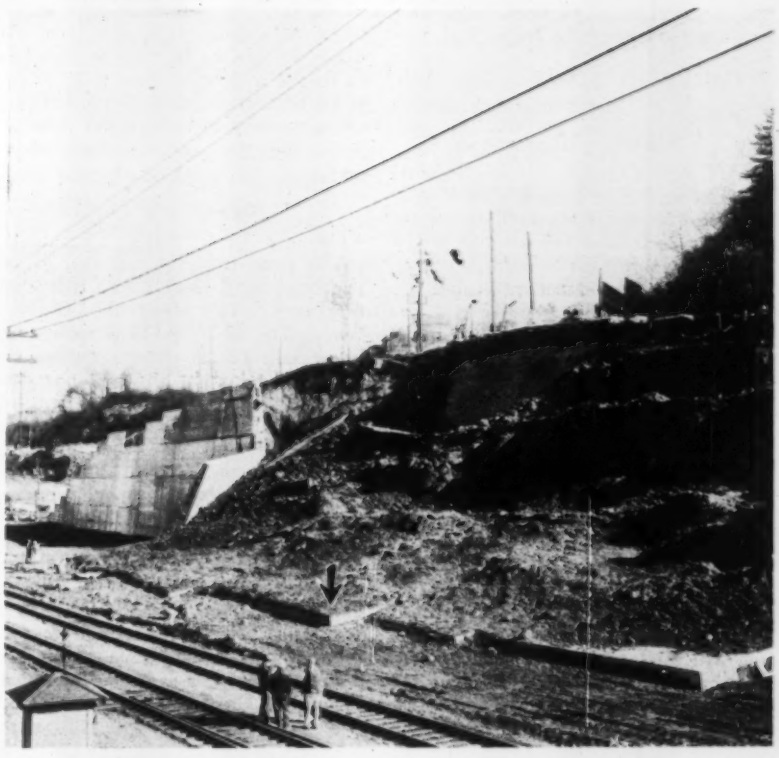
Under the towering theme structure of the Brussels World Fair of 1958, King Baudouin of Belgium last week lit a symbolic torch to mark the official opening of the most widely heralded international exposition since New York's World Fair of 1939. Dominated by the 360 ft high Atomium, whose nine 59 ft diameter spheres and 10 ft diameter connecting passages represent a cubic crystal of iron magnified 150 billion times, the 450 acre site of the fair was still abustle with final construction work two days before the opening, but a last-minute cleanup got things in presentable shape for the big day. An outstanding structural show because of the highly imaginative design of many of the buildings (ENR Sept. 26, 1957, p. 36), the fair includes among its exhibitors 41 nations and the Vatican, plus a number of public and commercial organizations.

Deck for Sunk-in-Place Spans

With decking of the west river span as the last major step, the new $12 million Morrison Bridge across the Willamette River in downtown Portland, Ore., is on schedule for completion in May.

The 206 ft long undecked span had been fabricated on barges at an upstream dock and floated into place. Water then was pumped into the barges, causing the 450 ton assembly to "sink" into place. The same method of erection had been used for the east span, on which decking is almost completed.

The center bascule span bridge is being built by the American Bridge Division of U. S. Steel Corp. Engineers for the project were Sverdrup & Parcel of St. Louis and Moffatt, Nichol & Taylor of Long Beach, Calif. The old bridge will be dismantled following opening of the new bridge to traffic.



Wall Came Tumbling Down

Toppled under tons of earth in the middle of the night on April 4, a 310 ft section of 70 ft high retaining wall along the Union Pacific Railroad's Albina Yards at Portland, Ore., will have to be replaced. The half million dollar project was to have made room for more tracks (arrow), which were to be laid within a week with trains operating on them by the end of the month. Designed by the railroad's engineering department and built by E. E. Settergren of Portland, the wall tapered from a 7 ft wide base to an 18 in. top. Engineers of the railroad are investigating the cause of the failure.

Stretching into the heart of Chicago from the Indiana tollroad terminus, Calumet Skyway opened to traffic last week. Now it's possible to drive New York to Chicago on scarcely a mile of free road.

$101 Million Skyway Opens

Chicago opened its $101 million Calumet Skyway Toll Bridge last week, marking the completion of the entire project in a total of two construction seasons despite shortage of some materials, restricted working areas and traffic congestion from trucks and passenger cars.

The six-lane divided project isn't long—only 7.75 miles from end-to-end—but it is important, for it is the final link in an 837 mile tollway from New York City to Chicago. It connects with the western end of Indiana's East-West toll road at the Indiana-Illinois state line (106th St. and Indianapolis Blvd.) and angles northwest to 66th and State St. where it will connect with the south route of the city's comprehensive superhighway system.

Ramp connections between 63rd and 61st Streets join Michigan and Indiana Avenues which are being made one-way, southbound and northbound, respectively. There will be four intermediate points of entry and exit by access ramps. One of these—at 79th St. and Stony Island Ave.—will feed traffic to the south Lake Shore Drive and to downtown Chicago or on north to Milwaukee.

About half the skyway is on earthfill embankment; the remainder is elevated on structural frame bents and superstructures of complicated design and construction. Huge reinforced concrete retaining walls were needed for long stretches of embankment due to restricted right-of-way.

Chicago's Department of Public Works, headed by Commissioner George L. DeMent, was given the responsibility of constructing the 7¾ miles of controlled-access tollway, which is financed by revenue bonds to be retired by income from tolls. About $65.6 million of the $101 million project cost—originally set at $88 million—is for construction, with right-of-way cost at $13.2 million as the next major item.

• **Calumet River bridge**—The project got its name from the fact that its key structure is a high-level, three-span cantilever bridge over the Calumet River. The 325-650-325 ft span cantilever, with 125 ft clearance above the river, is flanked by three 180 ft deck truss spans on one side and by three 210 ft spans on the other side. The 2,460 ft long bridge contains 9,000 tons of structural steel.

The skyway was designed by seven firms of consulting engineers, under the supervision of DeLeuw, Cather & Co., as coordinating engineer; the section engineers are: Friedman, Kornacker Engineering Co., Alfred Benesch & Associates, H. W. Lochner & Co., Consoer, Townsend & Associates, A. J. Boynton & Co., J. E. Greiner Co. and Hazelet & Erdal.

Design criteria included a maximum speed of 60 mph, three 12 ft wide traffic lanes in each direction separated by a raised median 4 ft to 12 ft wide and 11 ft paved shoulders except on structures. Minimum sight distance is 525 ft, and maximum grade is 3%.

• **Construction timetable**—The first contracts—for furnishing and erecting steel—were awarded in April 1956. Demolition of buildings got under way the following month, and construction of the first substructure and retaining walls was started in June of that year. By the end of 1956, a total of $53 million had been awarded.

Contracts for roadway pavement construction were let early last year, and construction was carried on without let-up through this past winter. This necessitated enclosing considerable concrete work and heating it during freezing weather.

One reason for this crash-type of construction timetable was that contracts carried provisions for bonuses and penalties ranging from $250 to $2,000 per day.

• **Roadway pavement**—Except for the toll plaza area, which is paved with 10 in. of portland cement concrete, both 36 ft roadways have asphaltic concrete wearing surfaces.

All pavement on embankment sections of the skyway is carried on a 12 in. blanket of special granular material, for drainage. Pavements consist of an 8 in. stabilized stone base, placed on the granular blanket, then 5 in. of bituminous binder and 2 in. of asphaltic concrete wearing surface.

Roadway pavements on bridges and trestlework consist of reinforced portland cement concrete ranging from 5½ to 7 in. in thickness, topped with 1 in. of bituminous binder and a 1 in. asphaltic concrete wearing surface. Light weight concrete was used in the roadway pavements for the 650 ft central span of the cantilever bridge over the Calumet River.

• **Engineers in charge**—Throughout most of the planning, design and construction phases of the skyway, the city was represented by John G. Duba, then administrative engineering assistant to Commissioner DeMent, and now administrative assistant to Chicago's Mayor Richard J. Daley. A. L. Tholin is now administrative engineering assistant to the commissioner of public works, and F. F. Rosa is administrative assistant.

L. H. Cather is project manager for DeLeuw, Cather & Co. Roy H. Anderson is project engineer, and Norman Sack is construction engineer. John W. Zimmerman is engineer-manager of the Calumet Skyway Toll Bridge, and Edwin G. Boltz is his assistant.

Still another GMC TRUCK & COACH WAREHOUSE uses West concrete floor treatment

As in several previous GMC warehouses this **"one application treatment"** is exhibiting exceptionally fine durability to heavy duty service. Plans are to specify WEST Concrete Floor Treatment for all new warehouses — and apply it under the supervision of the WEST Representative.

At GMC Truck and Coach Division parts warehouses construction is under the direction of Mr. John J. Wygzoski, National Field Warehouse Manager, General Motors Truck and Coach Division, General Motors Corporation, Pontiac, Mich.

ONE APPLICATION OF ONE CONCRETE FLOOR TREATMENT

CURES · HARDENS · SEALS CONCRETE SURFACE

WEST Concrete Floor Treatment is a proven time-saving, labor-saving product that 1) Cures 2) Hardens 3) Seals newly-laid concrete surfaces with *one* application. It is a rubber based formulation with a quick drying solvent. Formerly as many as three separate products and applications were needed to obtain the same results.

WEST Concrete Floor Treatment can be applied immediately after horizontal surfaces have been troweled or as soon as the concrete can be walked on. Usually in *one* to *eight* hours. It is applied quickly and easily with a lamb's wool applicator. All the labor formerly required for cleaning the concrete surface after delayed concrete drying, and between the use of as many as three separate products and applications is eliminated.

WEST Concrete Floor Treatment is applied immediately after troweling. Its fast drying permits subsequent building operations to be speeded. It also dustproofs as it seals. This speeds the final cleaning. All foreign matter is easily flushed off the surface.

WEST Concrete Floor Treatment enables newly-laid, wet concrete to retain 95% of its moisture. This permits it to cure and harden while sealing the surface against acids, oils, greases and other foreign matter. This incongruous aspect of holding back most of the moisture while permitting some moisture to escape slowly is the key to this product's amazing success.

WEST Concrete Floor Treatment is colorless and will not alter the color of the poured mix. It goes on evenly and spreads quickly without streaks. One gallon covers from 300-350 sq. ft.

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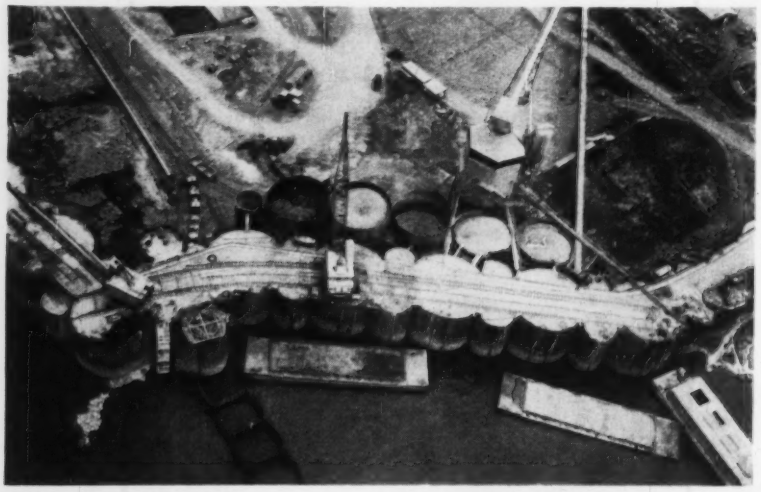
Concrete walls for new locks at Markland, Ky., on the Ohio River, are quickly taking shape behind half-mile-long cofferdam. Lock construction is first of 21 similar projects to improve navigation of the Ohio River

Lock Job Moves Fast With Water Borne

Dravo Corp., which has a reputation as a water based contractor, is building dual locks at Markland Dam on the Ohio River true to form. It's strictly a water based job, with major amounts of excavation and concreting being handled from floating equipment and all of the bulk materials moving in by barge.

The work consists of building two 35 ft lift chambers, side by side, one 1,200 x 110 ft wide, the other 600 x 110 ft wide. A cofferdam now encloses the lock walls and portions of the 1,000-ft-long upper and lower guide walls, but before it was completed, derrick boats and scows removed most of the 670,000 cu yd of earth and silt overburden. Later, 300,000 cu yd of rock were removed from within the cofferdams.



AGGREGATE AND CEMENT are brought to site by barge and unloaded directly into storage hoppers adjacent to the mixing plant located just inside the cofferdam.

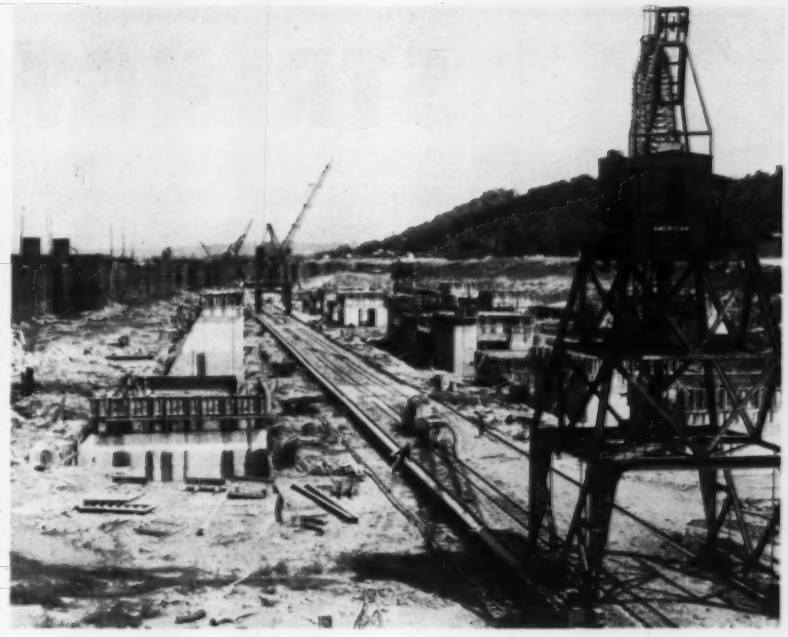
The cellular steel sheetpile cofferdam consists of more than 50 cells, some as high as 60 ft, plus connecting arcs. It extends 2,500 ft along the shore and as much as 500 ft out into the stream, enclosing 25 acres.

• **Bulk materials boated in**—The availability of downriver suppliers made it advantageous to bring in concrete aggregate and cement by barge. This in turn made it profitable to locate the storage, batching and mixing plant within the cofferdam adjacent to five mooring cells at the downstream end of the enclosure. Handling and moving the bulk materials is thus kept to a minimum.

Aggregate is unloaded from the barges by whirler crane and dumped into six storage cells. Cement is unloaded by blowers and rubber hoses which feed a 750 bbl silo adjacent to the batch plant.

Aggregate drops through remotely controlled gates at the bottom of the storage cells onto a 30 in. belt conveyor, travels to a rescreening and transfer plant and from there, by conveyor, to storage hoppers at the top of the mixer plant. At the rescreening plant, sand, ¾ in. gravel and 6 in. stone are bypassed, while 1½ in. and 3 in. stone are washed and fines are piped to the river.

The batching and mixing plant is set



INSIDE COFFERDAM concrete from the mixing plant is carried in 3 cu yd buckets on flat cars (arrow) to gantry cranes for placing in the lock wall forms.

Equipment

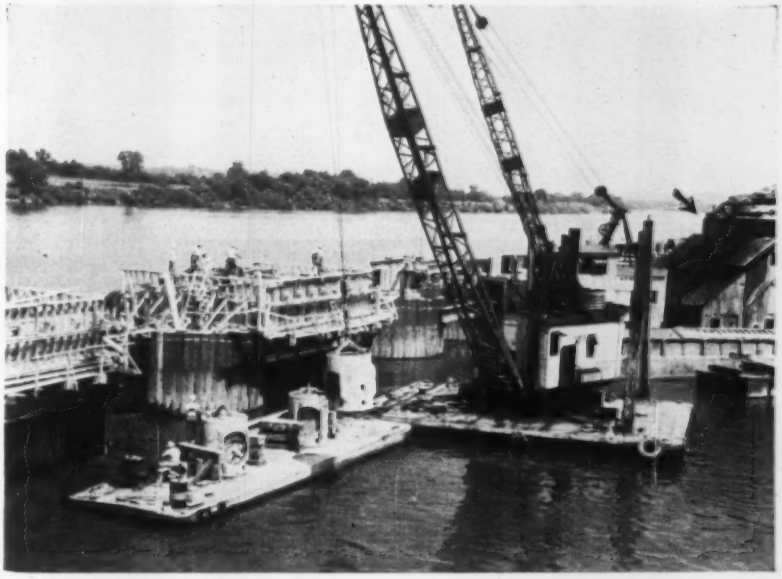
high off the floor of the cofferdam in anticipation of probable flooding during high water. Last April the cofferdam flood gates did have to be opened, but the water reached only to the floor of the mixer room and caused no damage.

When, after a five-week delay, the river level receded, 400 million gal of water had to be pumped out with three 15 in., one 10 in. and several 6 in. pumps.

The automatic batch plant produces about 2,000 cy yd of concrete a day to supply the 440,000 cu yd required in the lock and guide walls. It turns out a wide variety of mixes from natural and portland cement, blending coarse sand and four sizes of stone—¾ in. gravel and 6 in., 3 in. and 1½ in. crushed limestone.

In the concrete plant, components are weigh-batched automatically and discharged into one of three 3 cu yd mixers through a swivel chute.

After mixing, concrete is dumped into a wet batch hopper, which loads 3 cu yd buckets. A dinkey 42 ga railroad shuttles the buckets back and forth between batch plant and forms where gantry cranes place the concrete.



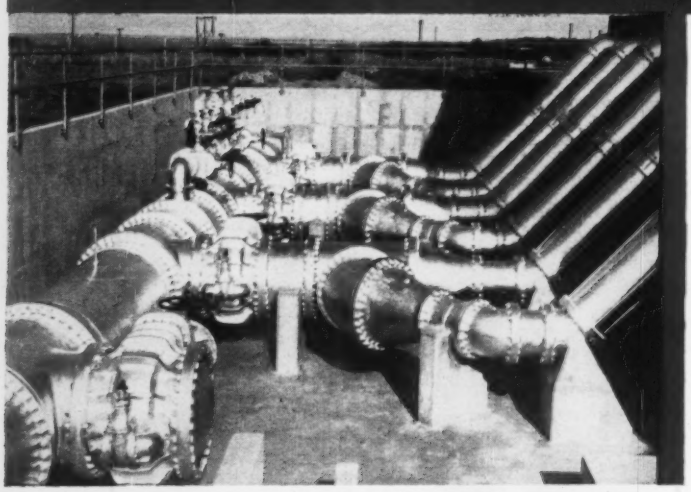
OUTSIDE COFFERDAM concrete from the mixer boat (arrow) is ferried by barge to one of three derrick boats for placing in forms making up the guide walls.

• **Guide walls outside cofferdam**—Three derrick boats and a mixed boat are being used to drive piles and place concrete for the guide walls. A total of 77 cells is being placed to support the guide walls. The upper wall, which will be 25 ft wide at the bottom and only 5 ft at the top, will rest on cells filled entirely with concrete. The lower guide wall will be supported by interconnected cells filled with sand and gravel. Both walls will be reinforced concrete.

Located 60 miles downstream from Cincinnati, Ohio, the locks will stretch more than half a mile along the Kentucky shore across the river from the present locks. The new locks will replace five old locks and dams and decrease the locking time for barge tows by seven hours on one 75 mile portion of the Ohio.

Construction is being supervised by the Cincinnati District of the Corps of Engineers, with Judson O. Young, the resident engineer. For Dravo Corp. of Pittsburgh, Pa., Roy Switzer is project superintendent.

STRENGTH PLUS



Corpus Christi, Texas—Cast Iron Pipe installation in filtration plant showing 48" discharge manifold which is connected to 48" Cast Iron city supply line.

Chicago, Ill.—Cast Iron Pipe for installation of new water main under West Madison Street.

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LOCATION	SIZE	TEST SECT. IN FEET	VELOCITY F.P.S.	AGE YEARS	W & H "C" FACTOR
Bowling Green, Ohio	20"	45,592	0.7-2.4	New	142.5
Chicago, Illinois	36"	7,200	2.6-3.6	New	147
New Orleans, La.	12"	39,650	1.2-2.9	New	141
Corder, Mo.	8"	21,350	0.9-2.3	New	143
Univ. of Illinois	8"	400	3.14	New	150
Concord, New Hamp.	14"	500	1.7-2.2	New	151
Concord, New Hamp.	12"	500	2.0-3.4	11	142
West Palm Beach, Fla.	12"	500	3.6-5.4	15	139.5
Greenville, S. C.	30"	87,376	2.4-2.7	12	148.5
Corpus Christi, Tex.	30"	65,641	1.1-1.8	6	146
Summerville, S. C.	8"	500	1.98-2.43	13	142.5
Champaign, Illinois	16"	3,920	3.1-5.6	22	139.3

*Available upon request: Booklet containing flow test and tables on Cast Iron Pipe.

Here's the proof of strength

1. CRUSHING STRENGTH *. . . Standard 6" Class 150 cast iron pipe will withstand a crushing load, under standard tests, of 17,900 pounds per foot . . . important where heavy fill or shock from heavy traffic loads are encountered.
2. BEAM STRENGTH *. . . Settlement soil movement, or disturbance of the soil by underground construction places a heavy strain on pipe. A length of 6" class 150 cast iron pipe bears up under a load of 20,790 pounds and deflects over 2¼ inches.
3. BURSTING STRENGTH *. . . Tests prove that standard 6" class 150 cast iron pipe withstands internal pressure of 3000 pounds per square inch . . . providing a safety factor ample to resist high working pressures and water hammer.
4. JOINT STRENGTH . . . A full range of leak-proof, low cost, easy-to-assemble joints for pipe and fittings are available to meet all conditions.
5. CORROSION RESISTANCE . . . Cast Iron Pipe resists corrosion . . . vital factor in its proven long life and dependability.

*Based on independent laboratory tests.

pipe FOR MODERN WATER WORKS

OUTLETS...
as you need them...

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On many important projects, reinforced concrete and R/C Duct Floor construction is providing better structures for less money, maximum fire safety, and low annual cost. For example, the Managing Director of the Citizens Gas & Coke Utility, of Indianapolis, states, "The use of R/C Duct Floors throughout our new office building has given us complete flexibility of electrical outlets adequate for future as well as current requirements. Our needs were met at a cost considerably less than with other systems—and this was done without sacrifice of our basic requirement—a monolithic concrete structure.

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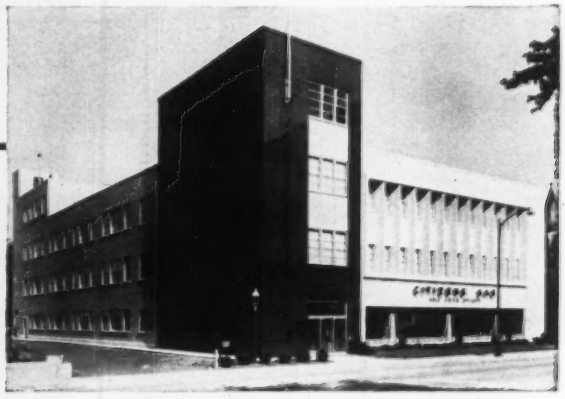
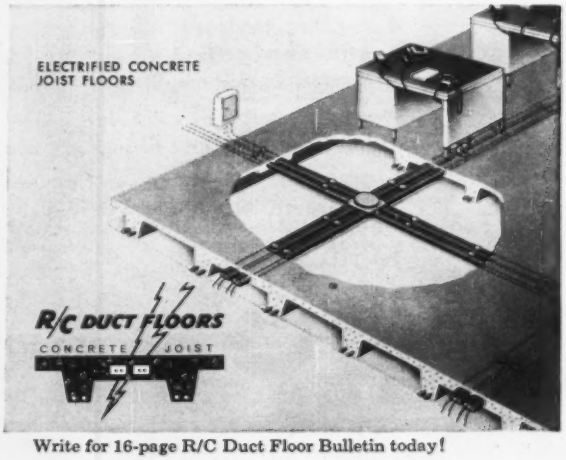
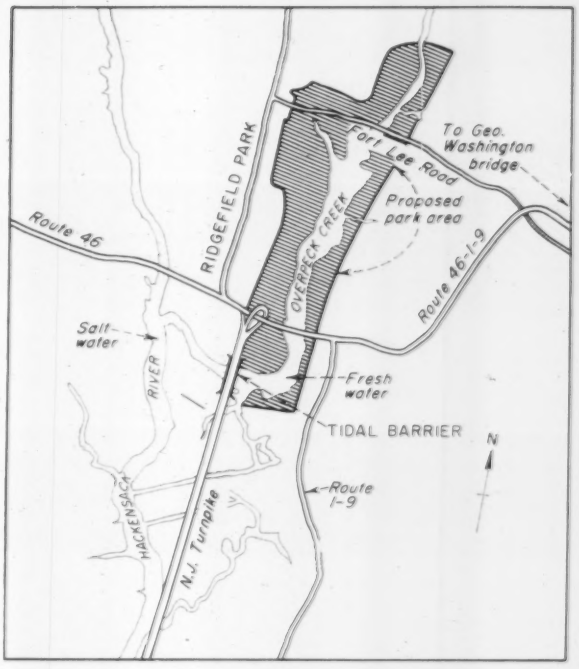


*Citizens Gas & Coke Utility Building, Indianapolis, Indiana
Architect: D. A. Bohlen & Son, Indianapolis
Gen. Contractor: F. A. Wilhelm, Indianapolis



Write for 16-page R/C Duct Floor Bulletin today!

An unusual, automatically operated, barrier separates the salt water of the Hackensack River from the fresh water of Overpeck Creek, forming a lake around which is planned a $14 million park.



TAINTER AND BASCULE GATES make up the barrier which is part of a N. J. Turnpike bridge. Cross-hatched area (right) may eventually be transformed into a picturesque park.

Automatic Tidal Gates Create Lake

Frederick C. Ziegler
Supervising Engineer
Seelye, Stevenson, Value & Knecht
Consulting Engineers
New York, N. Y.

An unusual installation of tainter and bascule gates that has functioned successfully for eight months, operates automatically to keep the tidal Hackensack River from entering a newly created fresh water lake in Ridgefield Park, N. J. The tidal dam, built as part of a 13 span bridge supporting the New Jersey Turnpike over Overpeck Creek, is designed to form Overpeck Lake, around which is planned a $14 million marine and recreational park.

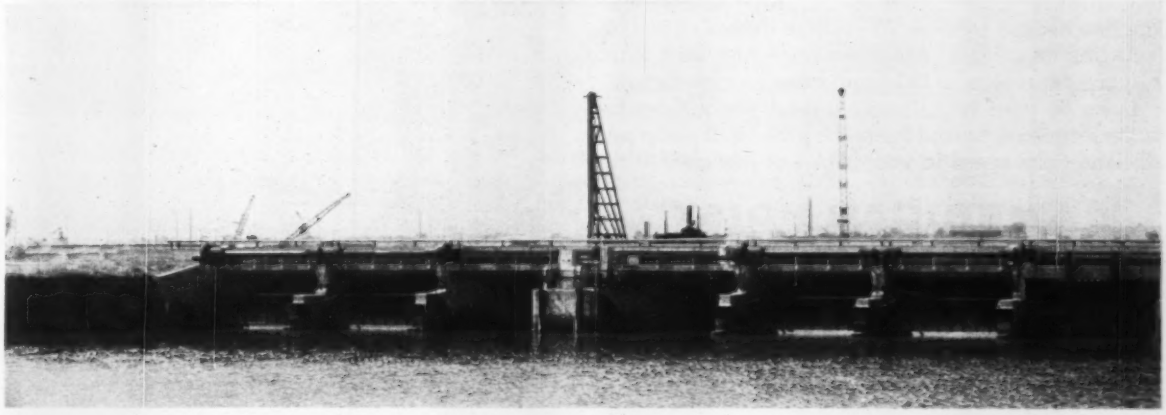
The park project is part of Bergen County's long-term program to transform these unsightly mud flats into a picturesque public playground and picnic site (ENR Sept. 26, 1957, p. 26).

Work started in 1953 at the upstream side of the bridge. From left to right bank, the barrage consists of two tainter gates, a bascule gate, a control chamber, the second bascule and two more tainter, gates. Seven other openings, for emergency discharge, are closed with creosoted timber stop logs.

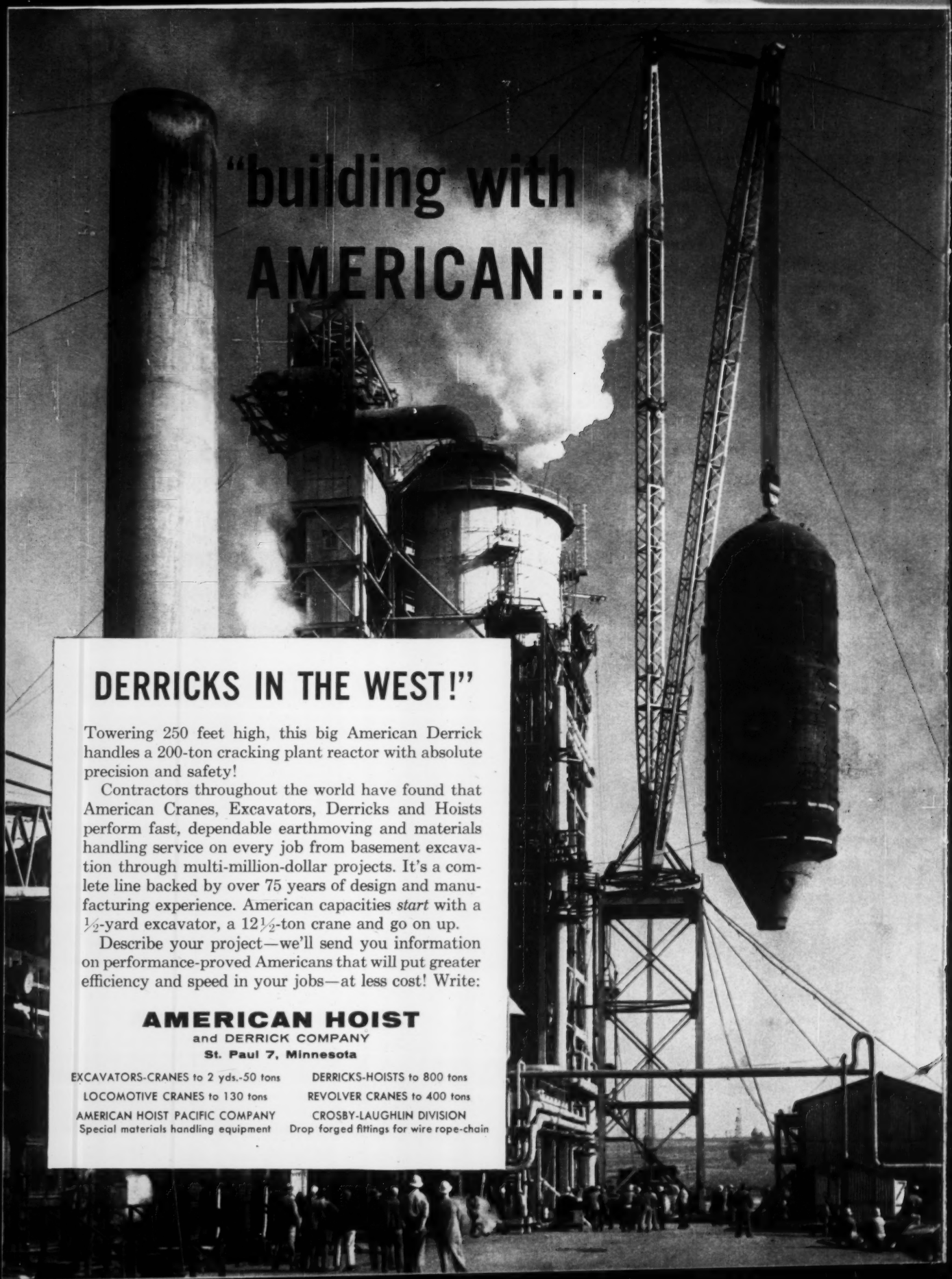
The small tainter gates are 20 ft wide and 9 ft high on a radius of 10 ft. They rotate on trunnions anchored with bronze bolts to masonry piers. The gates are raised and lowered electrically by chains attached to individual shafts that are supported along a catwalk at roadway level. The bascules—also 20 ft wide by 9 ft high—can be raised to the same closure height obtainable with the tainter gates.

• **Forming the lake**—Water level of Overpeck Lake is normal at El 1.0 (above msl) and varies during the seasons between El 0.5 and El 2.0.

(Continued on page 35)



OVERPECK TIDAL BARRIER looking downstream. From left to right are two tainter gates, bascule gate, the control chamber, another bascule, two tainter gates and the first of seven bays of stop-logged openings to be used for emergency conditions.



DERRICKS IN THE WEST!"

Towering 250 feet high, this big American Derrick handles a 200-ton cracking plant reactor with absolute precision and safety!

Contractors throughout the world have found that American Cranes, Excavators, Derricks and Hoists perform fast, dependable earthmoving and materials handling service on every job from basement excavation through multi-million-dollar projects. It's a complete line backed by over 75 years of design and manufacturing experience. American capacities *start* with a ½-yard excavator, a 12½-ton crane and go on up.

Describe your project—we'll send you information on performance-proved Americans that will put greater efficiency and speed in your jobs—at less cost! Write:

AMERICAN HOIST
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EXCAVATORS-CRANES to 2 yds.-50 tons
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Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

. . . Automatic tidal gates

During ordinary runoff conditions the bascule gates will be raised and lowered automatically depending on the difference between tide and lake levels. Tidewater must be 6 in. lower than the lake level before lake water will be discharged over the bascules. If the lake level should rise faster than the bascules can discharge the excess water, all four tainter gates will rise to allow full free discharge.

In an emergency, such as high lake level and hurricane or continued heavy rainfall, (possibly accompanied by high tidewater), the seven other water openings can be used. This will be done by raising the stanchions with portable, manually operated jacks to release the stop logs.

• **Lake level control**—Automatic operation of the bascule gates is regulated by two float tubes, one on each side of the tidal gates. The four tainter gates similarly are controlled by a pair of float tubes. Each float for the tainters is housed in a vertical length of cast iron pipe fastened to the concrete waterway structure but not touching lake bottom. On the lake side, the pipe is strapped to the face of the control chamber. A ceramic float supported by a metal tape is suspended from a rotating drum connected to an electrical activating system.

The float on the tidal side is similar, and functions in the same way except that the lake control causes the tainters to lift only when the tidal control permits it to operate—when tidewater is 6 in. lower than the predetermined critical lake level.

The floats controlling the bascules function on a different principle. Float tubes are connected below water level to the interior of the control chamber, and terminate in a bubbler device (wherein gas bubbling through water responds to pressure differential of changing water levels). This operates an actuating instrument connected to the gate operating mechanism.

• **Anti-frost element**—Fastened to the inner surface of each of the four submerged lakeside and tideside float tubes is an electric heating element within a sealed protective pipe. Current is manually controlled. Heating elements also are fastened to a wall in the control chamber and installed in the torque tubes of the bascules and in pipes embedded vertically in the masonry piers close to the armature plates.

Each of the two bascules has its separate operating mechanism house in the control chamber. The mechanism consists of a heavy vertical lever arm connecter at its lower end (its rotating axis) to a trunnion, which transmits a raising or lowering motion to the gate torque tube.

SMALL TAINTER GATES 9 ft high by 20 ft wide are operated automatically by chain drives supported along a roadway level catwalk on the N. J. Turnpike in Ridgefield Park.

The upper end of the lever is connected to the piston of a hydraulic cylinder. Oil to operate the cylinder is under high pressure. Pressure is maintained by an air cushion automatically supplied at intervals by a compressor and air receiver mounted in the control chamber. As the oil in the pressure tank is depleted, it is repumped from the reservoir tank for reuse.

• **Protective coating**—The lower parts of the bascules are submerged at all times, becoming inaccesible for inspection and for maintenance painting. Likewise the stanchions holding the stop logs in the seven water openings are inaccessible below El 1.0.

After the gates and stanchions were installed, it became necessary to remove one of the stanchions. It was discovered that a 1 in. layer of barnacles had formed on the steel surfaces during an eight-month period. This barnacle condition occurred in a zone about 3 ft below mean sea level, in which a coal tar base coating originally applied had been entirely destroyed. The steel stanchions had become pitted. Sheet neoprene ⅛ in. thick was then applied within the barnacle zone after the steel surfaces were sandblasted to grey metal. Barnacles will undoubtedly become attached to the neoprene treated surface in the future, but they are not expected to destroy or damage it.

Easily accessible parts of the bascules and stanchions received coatings of cold-applied coal tar base material while the tainter gates, always conveniently accessible for maintenance, were coated with hot-applied coal tar base enamel.

• **Cathodic protection**—Because of the possibility of future galvanic damage to the steel in the presence of an electrolyte coupled with the nearness of the bronze armature plates, all submerged areas of the steel gates and stanchions were provided with cathodic protection.

Water samples taken during tidal movements showed about 400 ppm chloride. Cathodic protection was based on this figure. Magnesium was used for the sacrificial anodes.

If a mechanical failure occurs in the automatic operation of the installation, a signal is transmitted over telephone lines to the American District Telegraph office at Paterson. This warning is telephoned to the Bergen County Police Headquarters, where the officer on duty conveys the message to the responsible official whose duty it is to dispatch the attendant to the dam. An attendant makes periodical checks of the installation.

The gate installation contractor was Kuchar Brothers of Montvale, N. J. and the electrical installation subcontractor was Electricon, Inc., of Fairlawn, N. J. The gates, operating devices and appurtenances were fabricated by S. Morgan Smith Co., electric equipment by Westinghouse, automatic controls by Automatic Controls Co., and Mason-Neilan.

Cost of the project was some $200,000. Engineers were Seelye, Stevenson, Value & Knecht, New York, represented by the author. Bergen county engineer is Roscoe P. McClave.

Now! The greatest concentration built into a truck engine!

Ford's all-new Super Duty V-8's—with displacements of 401, 477 and 534 cubic inches—are designed to handle GVW's up to 51,000 lb. and GCW's up to 75,000 lb. on America's toughest runs. And their endurance has been proved, not only in dynamometer labs and on the proving grounds, but in commercial fleets from coast to coast.

You get more miles with less downtime! These all-truck engines combine an entirely new concept of engine cooling with the latest developments in mechanical design and materials, setting new Ford standards of performance and dependability in heavy-duty truck service. Here is the "how and why" of Ford's superiority:

Exclusive three-stage cooling provides fast, uniform warm-up. Coolant flow is controlled by a second thermostat that balances the rate of warm-up and expansion of block and heads. Stress concentrations and the possibility of head warpage are virtually eliminated.

High-capacity water pump, the heart of Ford's cooling system, circulates over 200 gallons per minute. High volume coolant flow, with little or no aeration, supplies vital scrubbing action at valve guides and seats. Another advantage of this unique pump—its high capacity (50% more than competitive types) is obtained with no increase in required horsepower.

Water-jacketed fuel-air intake passages, in manifold *and* heads, maintain correct and uniform fuel temperatures from carburetor to combustion chambers. This results in proper vaporization and equal distribution of fuel-air mixture to each cylinder for improved economy and maximum engine smoothness.

New "In Block" combustion chambers transfer heat concentration from heads to block for 360° chamber cooling. This transfer allows better cooling of head and valve areas, greatly increasing the life of these parts. Combustion heat absorbed by the head of the aluminum alloy piston is transferred to the long, solid piston skirt. From there it is readily dissipated through the cylinder wall into the coolant which surrounds cylinder throughout the entire length of piston travel. The result is long life pistons and rings.

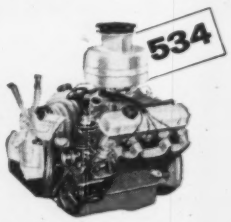
Internally mounted oil cooler keeps oil at lower temperatures for better lubrication. Reduced oil temperatures maintain greater oil film strength and reduce oil carbonization. Also, cooler oil means cooler running, longer lasting rod, main and camshaft bearings.

Fully machined combustion chambers mean close tolerances for accurate regulation of compression pressures. In Ford's new Super Duty V-8's, all surfaces of the combustion chamber (cylinder wall, bottom of head and top of piston) are precision-machined. Piston tops have a tapered step to maximize turbulence for improved combustion with regular grade gasoline. The smooth, straight surfaces of this wedge-shaped combustion chamber eliminate deposit-forming pockets to minimize harmful preignition.

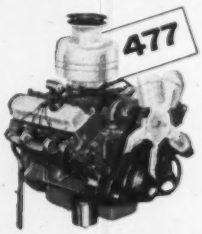
Turbulence Top pistons have four rings and three of them, including the oil ring, are chrome-faced for long life. The top ring groove has a bonded cast-iron insert to further reduce wear. Piston tops are extra thick to withstand high compression pressures. Each piston contains thermal struts that control expansion for a precise fit, hot or cold.

Hard-faced intake *and* exhaust valves with wear-resistant valve seat inserts are a Ford exclusive. Valves are made of heat-resistant materials and heads are dish-shaped to allow them to seat readily. To minimize the possibility of sticking, valve stems are electrolized, a surface treatment previously restricted to aircraft engines. Positive rotators provide a self-cleaning action for

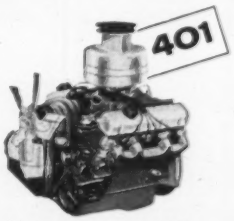
NOW!
Three all-new all-truck V-8's



277-hp Short Stroke V-8 . . .
Torque: 490 lbs-ft @ 1800-2300 rpm



260-hp Short Stroke V-8 . . .
Torque: 430 lbs-ft @ 1800-2300 rpm



226-hp Short Stroke V-8 . . .
Torque: 350 lbs-ft @ 1800-2300 rpm

American Business buys more Ford Trucks than any other make!

# of endurance features ever

They're all standard in Ford's new Super Duty V-8's

more perfect seating and sealing. Any valve material requires good cooling for long life. Ford's new Super Duty engine design makes more coolant available for lower valve temperatures. This coolant flowing past Ford's integral valve guides quickly carries away valve heat. In addition, exhaust valves are sodium-filled for rapid transfer of heat from head to stem. The sodium is added by a unique process that eliminates welding, thereby strengthening the valves.

Hot testing of every Super Duty V-8 is a typical example of Ford's quality control. Each engine is run for 20 minutes to check smoothness, timing, valve lash adjustment, oil pressure, and push rod rotation.

The engine is then partially disassembled. Parts are inspected for condition and alignment. Special attention is given to bearings and other items that might cause premature failure. The engine is then reassembled and run for about 10 minutes to check timing, noise level, acceleration, smoothness and coolant, oil or compression leaks. Only Ford uses such a detailed inspection of every engine. This is done to provide you with a more dependable truck.

New submerged electric fuel pump virtually eliminates vapor lock and maintenance problems. Mounted in the bottom of the tank, it pushes solid fuel under pressure from tank to carburetor. Its electric motor is sealed in a stainless steel capsule, and operates the pump by magnetic drive.

Every engine part is a truck engine part designed and built exclusively for Ford's all-new Extra Heavy Duty trucks. The same attention to detail required for durability in the major components has been carried over to all other parts as well. Listed below are but a few typical examples:

Stainless steel gaskets at heads and exhaust manifolds practically eliminate tie-ups due to blown gaskets.

No external oil lines to break. Oil filter and air compressor are mounted directly to block.

Valve stem seals are of same material developed for use in government missile program.

Rotor-type oil pump maintains high output, virtually unaffected by normal wear from extended operation.

Dual exhaust system provides far easier breathing and higher volumetric efficiency.

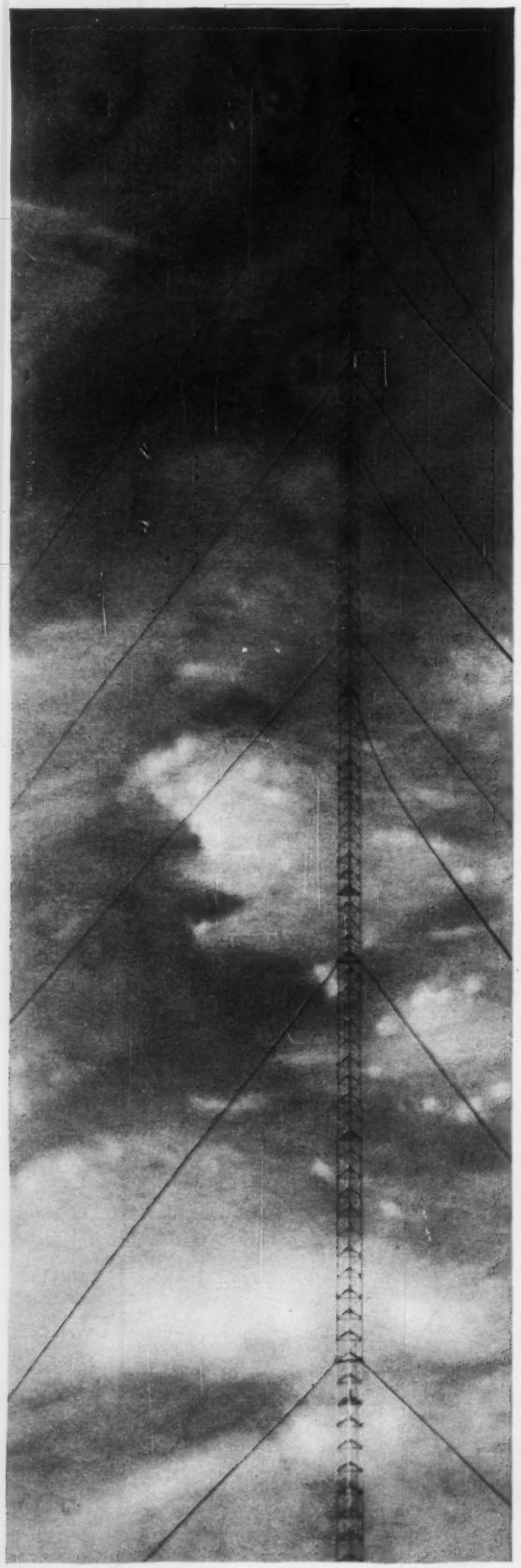
Alternator system replaces generator for longer electrical life.

Biggest Ford trucks ever built! Ten new series—Tilt Cabs, Conventionals, Tandems—up to 51,000-lb. GVW, 75,000-lb. GCW. For complete information see your local Authorized Ford Dealer.

Big truck built... big truck powered... at Ford's low prices!

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!



Six Sets of Roebling Guys Keep 1356 Foot TV Tower in (and on) the air

The WTEN-TV transmitting tower in Albany, N. Y. is the second tallest man-made structure east of the Mississippi River, taking second place only to the Empire State Building. Kline Iron & Steel Co. of Columbia, South Carolina, designed, fabricated and erected this "Kimco Tower." Two even taller towers are contemplated at Durham, N. C. and Columbia, S. C. When completed these will be the tallest towers in the East.

This Kimco Tower is held vertical to the earth by approximately 19,305 feet of various sizes of Roebling prestretched galvanized bridge strand. Specifically, the tower is guyed in this manner, starting from the ground up: three 630-ft. strands of 1" diameter; three 730-ft. strands of 1" diameter; three 870-ft. strands of 1⅛" diameter; three 1,230-ft. strands of 1⅛" diameter; three 1,400-ft. strands of 1¼" diameter; and topmost guys 1,575 ft. long with a diameter of 1⅛".

Literally, this is a new height in Roebling's experience. It requires manufacturing facilities that can furnish long lengths of strand to close tolerances (actually, each guy is accurately measured, under controlled tension, in feet and inches). Plus an unrivaled experience with suspension systems of all kinds. Roebling's activities in the suspension field include: bridges, tramways, ski lifts, materials-handling, suspended roofs and, of course, guyed towers.

Knowledge gained from these activities is at your immediate disposal. Whatever you contemplate—or want to know more about – Roebling will be glad to help. Write for your copy of our Bridge Division Booklet to Bridge Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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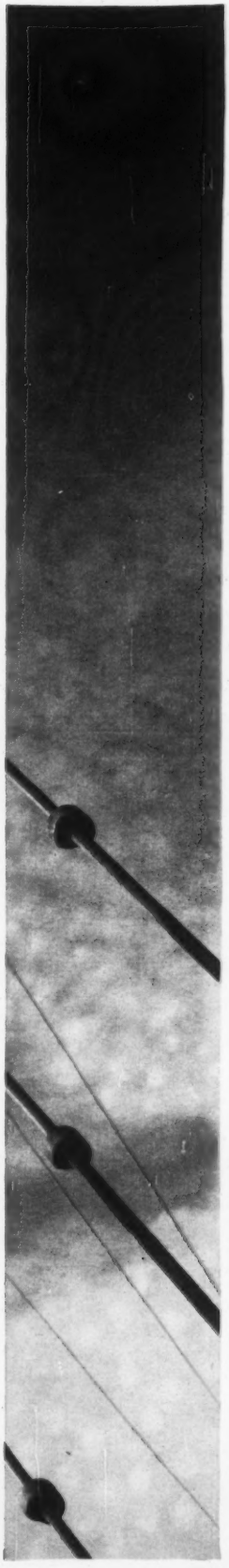
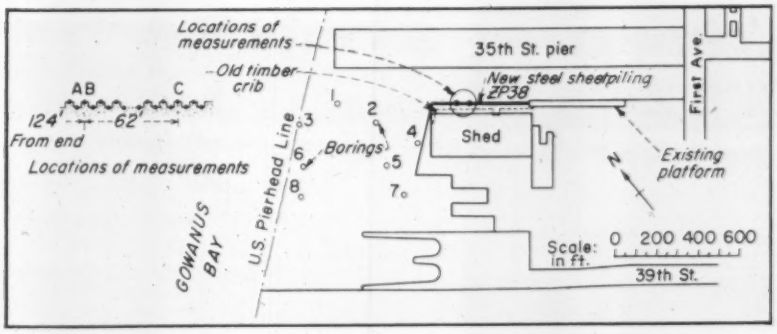
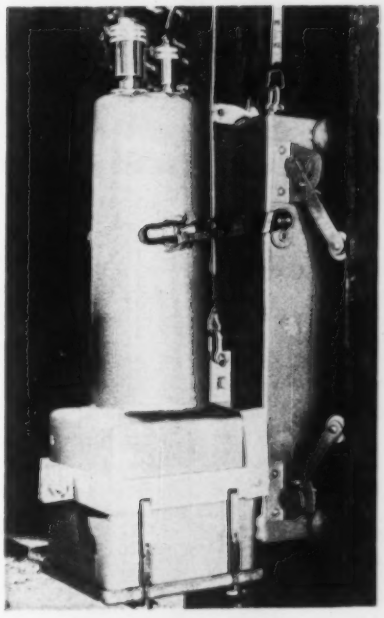




At an existing pier in Brooklyn, measurements were made on changes in slope of vertical steel piling to get the bending moment curve of the loaded pier facing.



The measuring device, essentially a clinometer, is the Wiegmann slope differential instrument. It gets . . .

Bending Moments by Direct Measurement

As reported to the Office of Naval Research by: Gregory P. Tschebotarioff, Professor; Edward R. Ward, Research Associate; Elmo DiBiagio, Jack Watkins and David Perrine, Graduate Assistants, Princeton University.

A device that measures changes in slope of loaded vertical sheetpiling as it is rolled along its surface has been tested by the Princeton University Department of Civil Engineering with promising results:

- Bending moments in the piles can be determined from the directly measured slope curve to an accuracy of 10%.
- Reductions in conventional design bending moments are possible in some cases and greater assurance of proper safety and economy in others.

The measuring apparatus is the Wiegmann Slope Differential Instrument, designed by Dietrich Wiegmann, an engineer and official of the Harbor Administration at Bremen, Germany.

The first model was used successfully in Bremen on a new pier.

• **The instrument**—The Wiegmann machine is essentially a clinometer, which permits the measurement of changes in slope of vertical steel sheetpiles (as well as H-piles) with such accuracy that differentiation of the slope curve becomes possible in order to obtain the bending moment curve.

The device has an electromagnet housed inside a carriage frame. This frame has four wheels mounted so that the two poles of the magnet are approximately ⅛ in. distant from the face of the steel surface along which the carriage rolls. One man, operating a small winch, controls the carriage.

A pendulum of non-magnetic material, 19.65 in. long, is clamped magnetically and provided with a mirror. A light source, remotely controlled, intersects the reflecting surface, on the axis of the pendulum's pivot arm, passing through a graduated glass arc and leaving a triangular and a hairline mark on a sensitive photographic paper.

The scale on the glass is also recorded on the film with each exposure. Some 80 exposures can be obtained on one film roll.

Each division on the scale corresponds to a slope of 0.0002. The thin hairline which moves with the light ray permits reading to one half of that value. The sensitivity of the readings corresponds to difference of slope equal to 1:10,000.

In cases when the pile is driven on a slight batter, and therefore was not vertical prior to its deflection, an adjustment in the original position of the instrument can be made by a slope adjustment arm. This arm is pivoted on the carriage and is movable in respect to the instrument. Two adjustments can be made in either direction from the original position when the pendulum and the plane in contact with the wheels of the carriage are parallel.

Prior to each measurement, a check calibration is made by means of a special base, to make sure that no dislocations occurred during transportation to the site.

• **Performance check**—A general performance check was made at the start of a project sponsored at Princeton University by the Office of Naval Research, Department of the Navy. The experiments were to investigate the possibility of appreciable reductions of the bending moments of anchored steel sheet pile bulkheads obtained by the free earth support method.

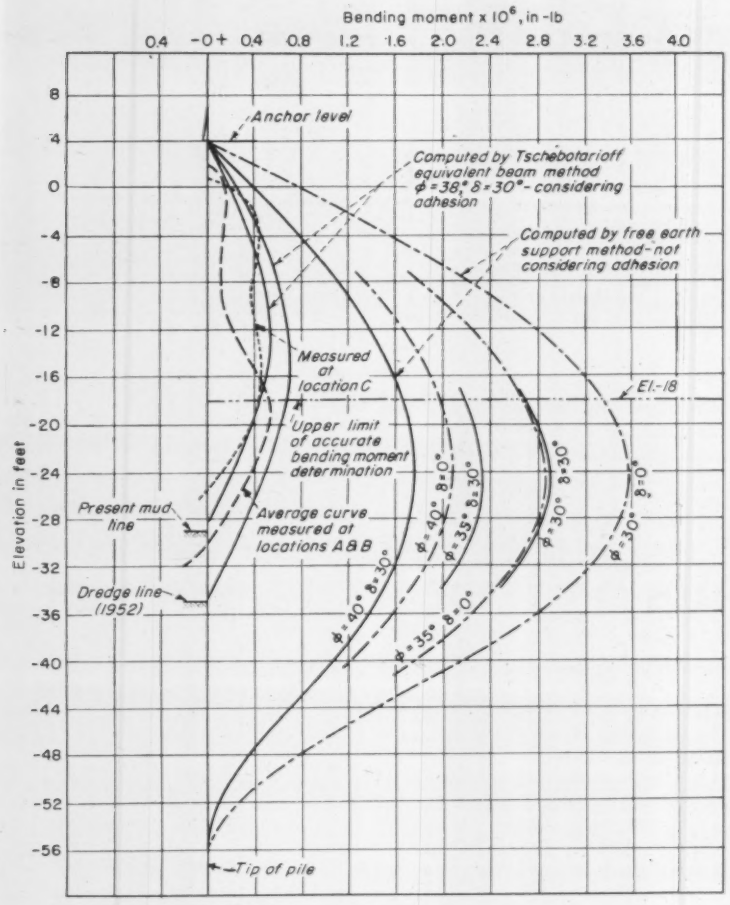
Taking into account the findings of preceding model tests, an improved method of design was proposed by Prof. Tschebotarioff. It was essential to verify the validity and to ascertain the possible limitations of these findings by measurements on full scale field structures, under varying conditions. A careful study of various field measurement procedures led to the selection of the Wiegmann Slope Differential Instrument.

The performance check was made on a 32 ft H pile, placed in a vertical position at Palmer Stadium, Princeton.

The Wiegmann instrument was lowered and raised repeatedly along the full length of the pile, with no lateral load on the pile. Three "runs" indicated a slight undulation of the surface of the web. Within about four feet, the slope changed by about 15 scale readings. Presumably this was the result of slight eccentricities of rollers in the steel mill.

Further measurements were made after applying concentrated lateral loads at approximately third points. By correcting the slope readings obtained under load for the irregularities obtained under zero load, it was noted that the measured and corrected slope curve

. . . Moments obtainable within five percent


Bending moment x 10⁶, in-lb
0.4 -0+ 0.4 0.8 1.2 1.6 2.0 2.4 2.8 3.2 3.6 4.0
Elevation in feet
8 4 0 -4 -8 -12 -16 -20 -24 -28 -32 -36 -40 -44 -48 -52 -56
Anchor level
Computed by Tschebotarioff equivalent beam method φ=38°, δ=30°- considering adhesion
Computed by free earth support method-not considering adhesion
Measured at location C
El.-18
Upper limit of accurate bending moment determination
Present mud line
Average curve measured at locations A & B
Dredge line (1952)
Tip of pile
φ=40° δ=30°
φ=40° δ=0°
φ=35° δ=30°
φ=35° δ=0°
φ=30° δ=30°
φ=30° δ=0°

COMPARISON OF THE BENDING MOMENTS as determined in the field and as computed using various design assumptions in addition to varying values of ϕ and δ.

coincided almost exactly with the theoretical curve. The agreement is in fact so good that the bending moment curve obtained by differentiation from the slope curve can be differentiated twice more to obtain the load values, with an error of less than 13% compared to actual load values at any location.

If no correction for irregularities under zero load is made, then no further differentiation of the bending moment curve is feasible. However, the maximum value of the bending moment obtained agreed within approximately 5% with the actual value of the maximum moment.

This finding means that it is possible to take measurements on existing bulkheads and obtain reasonably correct values for the bending moments even if it had not been possible to take any previous zero load readings prior to the backfilling of the sheet piling.

• **Field tests**—Field measurements were then carried out on the 36th Street pier in Brooklyn, New York.

No soil test data were available from the pier itself, but a number of borings had been made, in 1953, for a then-proposed extension. The borings revealed fairly uniform conditions throughout the adjoining area of 600 ft by 450 ft. Available pile driving records gave no reason to believe that conditions were any different there.

The sand and fine gravel which was found between El. −28 and −52 had an average resistance to penetration by a 2 in. split spoon sampler of 10 to 16 blows per ft using a 140 lb hammer falling 30 in. This sand was classified as medium density.

The underlying red silty clay had a plasticity index of about 11%, an average natural water content of 28%, a dry density of 98 lb per cu ft and an unconfined compressive strength of 1.8 ton per sq ft, qualifying for a "stiff" classification. Four samples tested were located between El. −60 and −83. According to the driving record of the spoon there was a somewhat weaker strata at El. −95 where the driving resistance was only 5 blows per ft on the average. This part of the clay deposit classifies as "medium" consistency.

• **Pier structure**—The original quay wall, built in 1909, was a rock-filled timber crib, with its bottom at El. −21—three feet below the old dredge line.

In 1952, ZP-38 steel sheet piles, 65 ft long, were driven to El. −57 in front of the old crib. The sheetpiles thus penetrated through the entire 25 ft sand layer and some additional 4 ft into the underlying stiff clay. The sheetpile wall was anchored to deadmen by steel anchor rods, and the space between the old crib and the sheet-pile wall (down to the old dredge line at −18 ft) was filled with tremie concrete. The material in front of the sheetpile wall was then dredged down to El. −35. The ratio of the depth of embedment to the total length of the pile is thus 22/65 or 0.34.

The first trial measurements were performed on a side wing wall with no overhanging deck, in a water depth of only 20 ft. The results were somewhat erratic because of the marine growth which had accumulated on the steel.

It became apparent that removal by divers of this growth along the entire length of the pile would be essential. A marked improvement was apparent as a result of the cleaning. Wave-like undulations, just as in the case of the H-pile used for a preliminary check, were also noticeable. Similar undulations were also recorded at a third location (C in accompanying plan) by three successive sets of measurements.

It was thus possible to draw an average curve through these points and expect results of the same accuracy as the one obtained during the preliminary performance check. An exception was the zone between the present mud line (at El. −20) and El. −25. This corresponds to the part of the pile which could not be cleaned off properly by a diver. A preliminary analysis of the results indicated the great importance of more precise data in the vicinity of the mud line, since doubts could exist concerning the exact location of the point of contraflexure of the sheet piles.

• **Exact procedures**—The following procedure was developed to obtain more accurate readings:

A 4 x 4 x 5 ft "portable" cofferdam was built of lightweight (8.6 psf) steel sheetpiles. This cofferdam was lowered along the face of the sheetpiling until it penetrated under its own weight some 3 ft into the soft mud which had silted up to the face of the pier bulkhead wall. With the inside of the cofferdam

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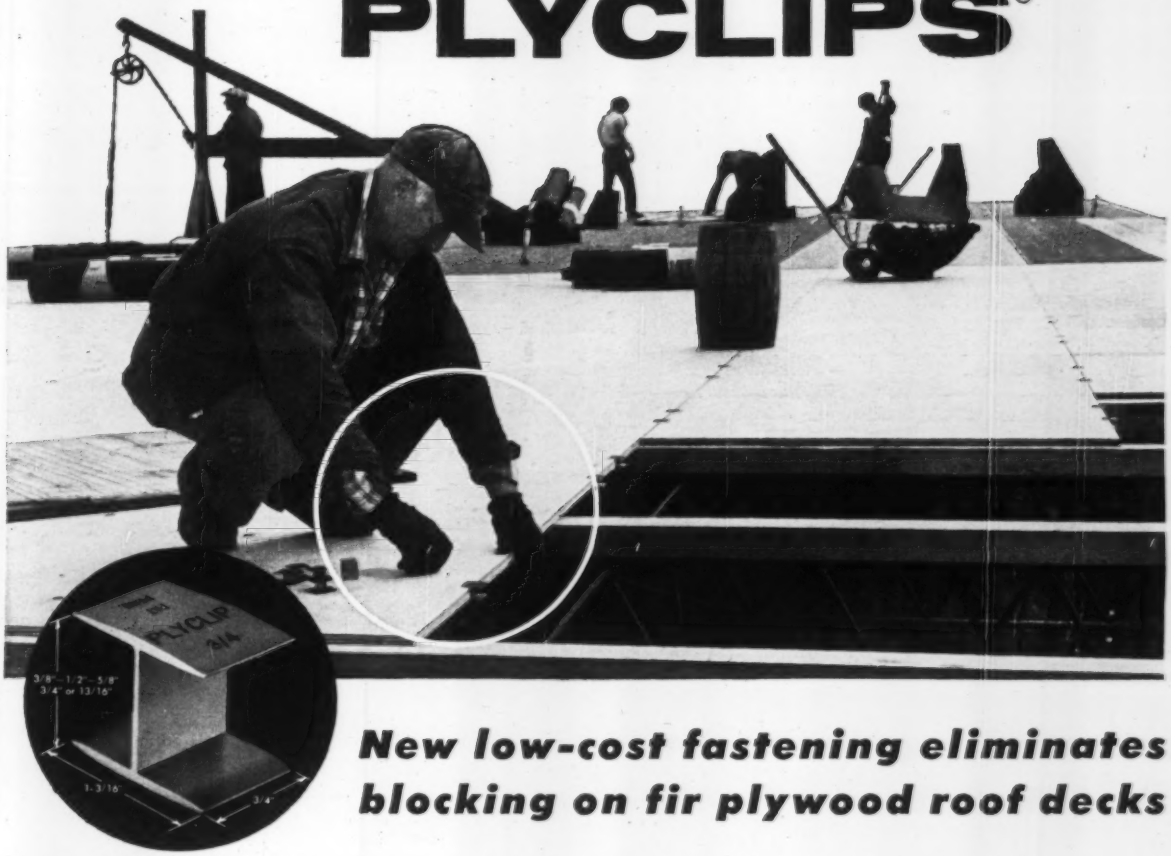

New low-cost fastening eliminates blocking on fir plywood roof decks

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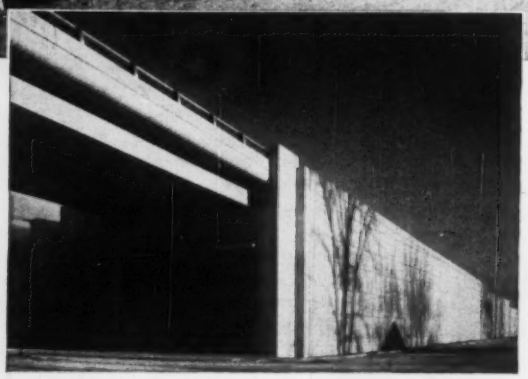
FIR PLYWOOD ON CALUMET



Big prefabricated fir plywood form sections helped cut costs, speed work on 8-mile long Calumet Skyway.

CALUMET SKYWAY TOLL BRIDGE LOCATION:
West end of Indiana Toll Road to downtown Chicago

COORDINATING ENGINEERS:
De Leuw Cather & Company

CONTRACTORS FOR FORMWORK:
R. R. Anderson Co., Chicago
Arcole Midwest Corp., Skokie, Ill.
M. J. Boyle & Co., Chicago
J. M. Corbett Co., Chicago
Kenny Construction Co., Skokie, Ill.

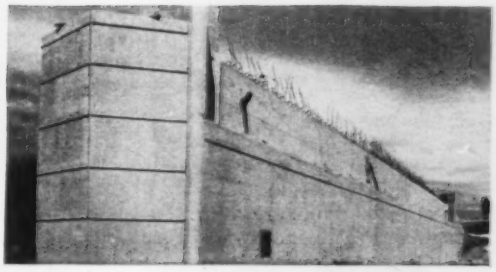
FORMS SPEED CONCRETING SKYWAY TOLL BRIDGE

GIANT FIR PLYWOOD FORM SECTIONS, as large as 28′ x 31′, played an important role in keeping work moving at a near record clip on the new eight-mile long Calumet Skyway which links the Chicago business district with the Indiana toll road.

The job features one of the world's longest retaining walls along three of the eight miles. Over 30 feet tall in places, the wall was formed by leap-frogging the big prefabricated plywood form sections. In most instances, forms were built to maximum wall height and simply cut down for shorter walls. Plywood forms were also used for abutments at street crossings and for beams and bridge decks on overpasses.

Plywood was called for in the job specifications for uniformly smooth concrete, but contractors on the job credit plywood's ease of fabrication and handling—coupled with a high number of re-uses (up to 15 or 20 pours)—with holding down costs as well.

All told, over 300,000 square feet of plywood forms were used by the five contractors concerned with pouring walls, abutments and decks.



Rustication lines on walls and abutments were achieved by nailing strips to face of plywood forms.

Fir plywood was also used for forming reinforced concrete beams and deck slabs on entrance ramps.

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EXTERIOR PLYFORM®—standard concrete form grade plywood made with waterproof glue to give as many as 25 or more re-uses.

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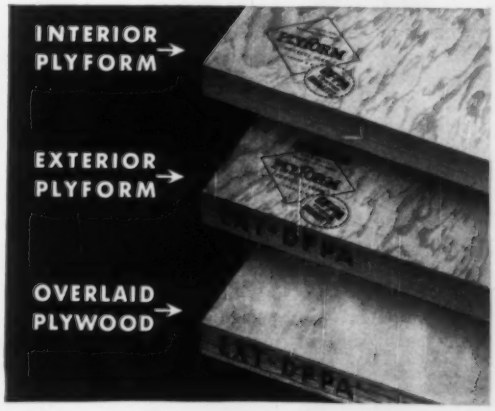
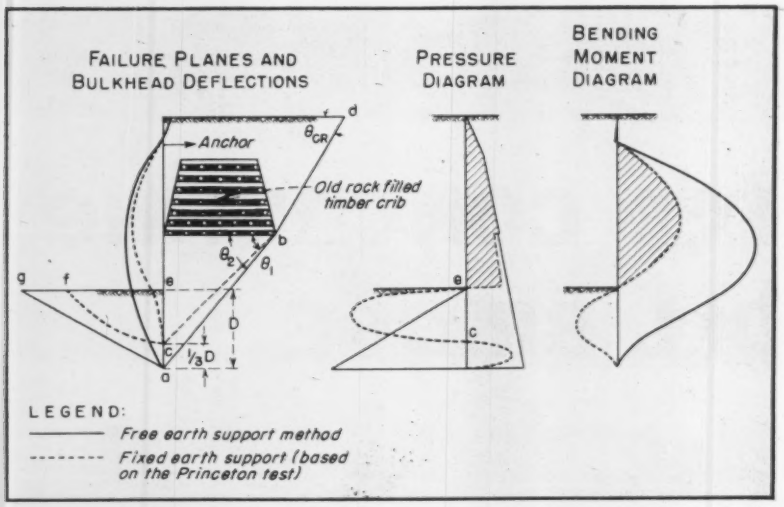


. . . Tremie concrete vs. bending moments



TIMBER CRIB BEHIND THE SHEETPILES had its effects on the probable planes and locations of failures, bulkhead deflections, the pressure diagram and the bending moment diagram of sheetpiling at the 36 Street Pier in Brooklyn off Gowanus Bay.

washed clean of mud, the surface of the pile was then cleaned down to El. −32. Then a new set of readings was taken between El. −18 and El. −33.5, where the cable supporting the instrument slackened, indicatiing that the instrument rested on the mud.

Readings were taken every three inches in the vicinty of the mud line.

Curves were obtained for two locations. The point of contraflexure was then found to be located at −27.5 ft for location "A" and at −29 ft at location "B"; that is, at least 6 ft above the original 1952 dredge line which reached into the sand at −35 ft.

Similar results were obtained at "C".

• **Effect of tremie concrete**—Above El. −18, tremie concrete placed between the crib and the steel sheetpiling may have increased the stiffness of the piling. Since the extent of interaction between the concrete and the steel sheetpiling cannot be determined with any accuracy, the bending moment curves were computed in all cases from the slope readings.

This accounts for the sudden drop in the bending moment values above El. −18 for locations "A" and "B". Some interaction between tremie concrete and steel sheetpiling must have been present at these two locations. On the other hand no evidence of such interaction was noted at location "C".

Therefore, the bending moment values computed for the field slope observations can be considered fully reliable only below −18 ft.

• **Bending moment—Computations by the free earth support method**—The presence of the old timber crib behind the sheetpiling imposed certain limitations on the location of failure planes.

There were also some uncertainties concerning the values of internal friction of the sand, since its density could only be roughly estimated from the drop penetration records of the sampling spoon.

Computations were carried out, for the equilibrium of a sliding wedge for several values of the angle of internal friction and of wall friction.

The values of the bending moments computed in this manner made it clear that the elevation of the maximum bending moment—according to the free earth support procedure—in all cases is 3 to 6 ft below El. −18. The actual bending moments reached their maximum at that elevation. The maximum values of the bending moments, are 3 to 7 times greater than the ones recorded.

• **Bending moments—Computations by the modified equivalent beam method.**—In order to apply this procedure logically to the present case, these further points should be made with reference to the location of the probable planes of failure and their effect on the pressure diagrams:

During the Princeton model tests, the passive pressure in front of the bulkhead below the dredge line dropped to zero at approximately ¾ of the depth of embedment; below that elevation, the pressures changed their sign and assumed values about equal to active or neutral earth pressure intensities.

It follows that the lowest plane of failure could not pass through the toe of the pile, but, in its most unfavorable position, would have to be located higher. Insofar as the general case is concerned this change in the position of the failure surfaces from the conventionally assumed line would not effect any change of the pressure diagram and of the bending moment diagram.

However, in the case of the Brooklyn pier, some reduction of pressure will result. The pressure diagram was therefore used for the relevant computations.

Two tables (I and II) give the values of the maximum moments and of the moment at elevation −18 ft for various values of ϕ and δ and for two different assumptions concerning the location of zero bending moments.

The difference between the two tables lies in the assumption concerning the vertical pressure exerted by the crib on the underlying soil. One assumes transmission of the entire weight of crib to the underlying soil. The other assumes adhesion to the steel sheetpile due to the action of the tremie concrete, with a resulting reduction of vertical crib pressures of ¼ of their original value.

The assumption of adhesion between crib and sheet piling produces bending moment curves which very closely approximate the actually observed distribution of bending moments as well as their maximum values.

• **Rowe's empirical coefficients**—In the case of a sand of medium density, a 65 ft long ZP-38 sheetpile—according to P. W. Rowe's empirical curves—would be subjected to a bending moment equal to 40% of a moment computed by the free earth support method. This value is higher than the ones actually recorded and illustrates the fact that Rowe's procedure is not adaptable to use for other than routine cases.

• **Advantages of Equivalent Beam Method**—Prof. Tschebotarioff's original equivalent beam procedure for sand and silts, under normal conditions, leads to bending moments equal to approximately 45% of the values obtained by the free earth support method. It is in close agreement in most cases with the later empirical procedure of Mr. Rowe. The latter procedure, however, is based on empirical coefficients related solely to flexibility of the pile and to the density of the sand.

The equivalent beam procedure can easily be adapted to reflect special conditions such as were present at the Brooklyn pier. This can be done by considering limitations imposed by such obstructions as a crib on the location of possible planes of failure. For $\phi = 40$ deg and $\delta = 30$ deg, this modified procedure leads to maximum bending moments equal to 36% of the maximum bending moments obtained by the free earth to support.

The assumptions of adhesion to the

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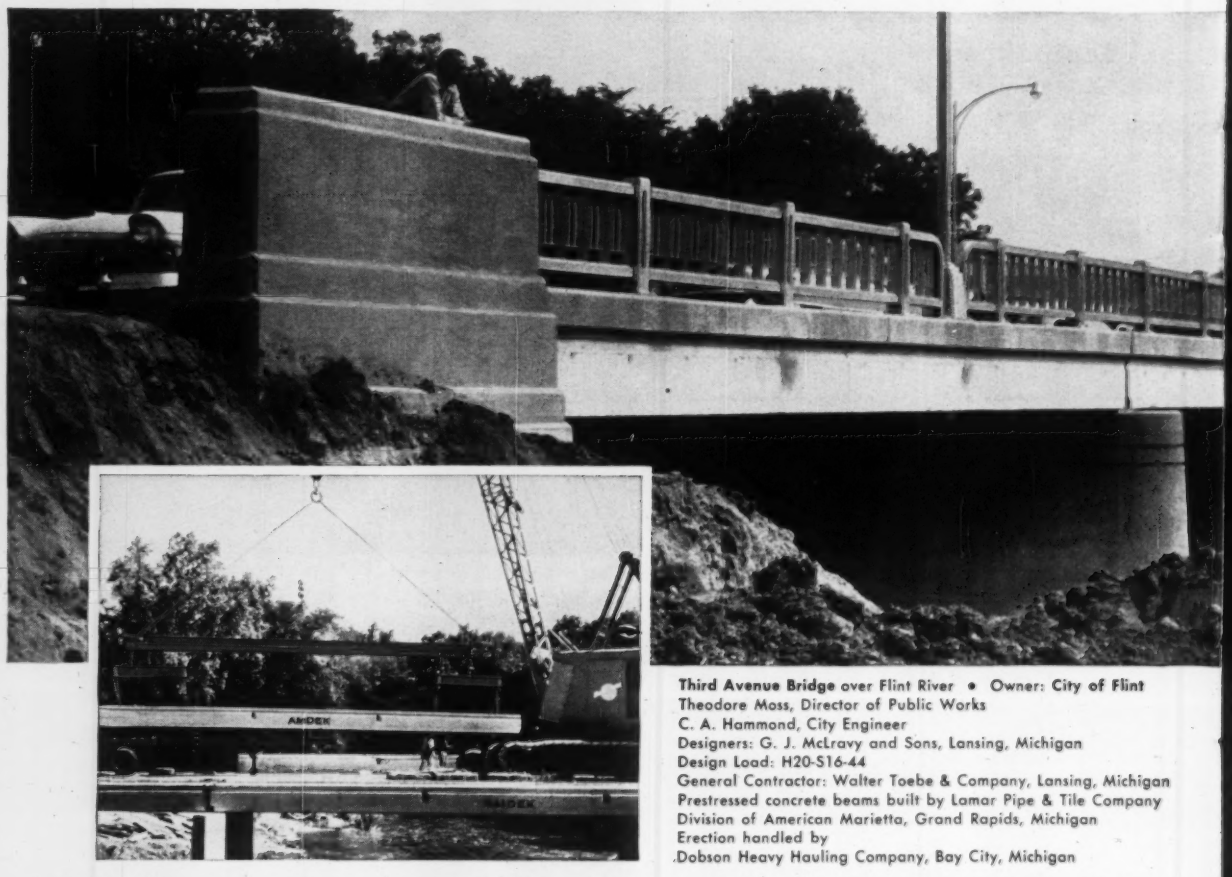

Third Avenue Bridge over Flint River • **Owner: City of Flint**
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C. A. Hammond, City Engineer
Designers: G. J. McLravy and Sons, Lansing, Michigan
Design Load: H20-S16-44
General Contractor: Walter Toebe & Company, Lansing, Michigan
Prestressed concrete beams built by Lamar Pipe & Tile Company
Division of American Marietta, Grand Rapids, Michigan
Erection handled by
Dobson Heavy Hauling Company, Bay City, Michigan

76 Beams Erected in 4½ Days with 110-Mile Haul!

The speed of prestressed concrete construction was dramatically demonstrated in the building of the Amdek Bridge at Flint, Michigan, shown under way in the photo above.

The 76 beams in this bridge went up in 4½ days. Said an observer: "I watched trucks pulling on the bridge. From the time one came to a stop and a girder was placed on the bridge, the average time elapsed was 12 minutes."

The prestressed components of this bridge were manufactured in just 20 days. It was estimated that well over a year would have been required for delivery of corresponding steel structurals.

Advantages of Prestressed Concrete

Fast availability and speed of erection are only two of many advantages that make prestressed concrete the marvel of modern building materials. Prestressing increases tensile strength of concrete tenfold. Less concrete is needed. Strength-to-weight ratio is high. Longer spans and thinner sections are possible. Recovery after overloads is greatly increased. Prestressing gives the ideal combination of concrete's permanence PLUS amazing flexibility and elimination of cracking.

The adaptability of prestressed concrete is as unlimited as the imaginations of engineers and architects. Today it is being used in a range of applications from fence posts to giant bridges and multistory buildings; from swimming-pool diving "boards" and movable parking lot curbs to airport runways and railroad snow sheds.

What triggered this trend to prestressed concrete? The development of practical, efficient tensioning materials. Union Wire Rope Corporation was a pioneer in this field. Today we're meeting the mushrooming demands for Tufwire high tensile wire and strand with on-schedule speed and dependability of supply. At the same time, we're gearing production facilities to the needs of tomorrow.

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Highway Program Calls for 300,000 Bridges! How Will You Share in Supplying Them?

The vast national highway construction project assures a 15-years-plus market for bridges. Most of them can be built much faster and more economically with prestressed concrete than with any competitive building material.

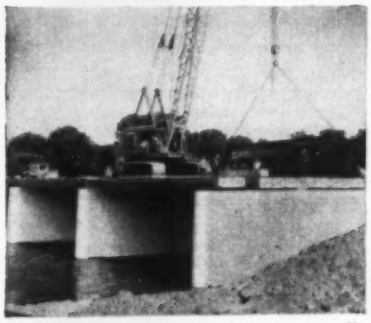
It's history's biggest order for bridges. A giant demand for present makers of prestressed concrete. And a king-size opportunity for those who decide to go into prestressing business now.

For prestressed concrete construction answers this bridge need as nothing else can. In high degree of strength and permanence. Speed of construction. Savings in time and money. More profit for suppliers and constructors, and greater value for taxpayers.

Prestressing offers opportunities not only for the on-site contractor, but also for the contractor who would like to operate a permanent casting yard as an arm of his business or as a commercial fabricator. Opportunities in bridges. Opportunities in buildings of every kind. Opportunities in highway slabs, now in the advanced experimental stage.

If you're a present user of prestressed concrete, or engaged in making it, our engineering department and research laboratory will be glad to give you a lift with any prestressing problem or project.

If you're considering the establishment of a new prestressing plant to supply your area, let us help you explore the possibilities.



16-ton girder has just been lowered into place. The girders are 27" deep and 3' wide box section, tensioned with 28-⅜" Tufwire strands in the approach spans and 28-½" in the center spans. Overall width at the bridge is 60-ft.

Approach spans are 58'10", center spans 52'6". During erection, the bridge was subjected to 144 tons of live load carried on just 6 girders—far in excess of load in normal use.

The prestressed girders were built on the casting beds, partial view above, of the Lamar Pipe & Tile Company at Grand Rapids, and trucked 110 miles to the job site. The four spans of the bridge total 210-ft.

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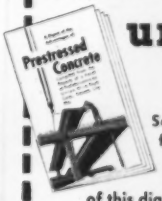

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. . . Experimental measurements conducted in Texas, Pennsylvania and Maryland

bulkhead lead to values which correspond much more closely to actually observed values than the ones assuming full crib weight effective, especially if one considers that the sand of originality medium density even after some further compaction by the driving of the sheet piles could hardly be expected to have shearing and frictional resistance in excess of values of $\phi = 38$ deg and $\delta = 30$ deg.

On that basis, the author's original assumption of a hinge at the dredge line El. −35 leads to bending moment values at El. −18 ft equal to 126% of the maximum values recorded.

In other words, the assumption of a hinge at the dredge line is entirely on the safe side for similar structures and leads to bending moments some 26% higher than the ones actually observed.

The assumption of a hinge at El. −28.5, representing the average points of contraflexure at the locations observed, leads to maximum bending moment values equal to only 28% of the free earth support method.

• **Studies elsewhere**—Other experiments have been conducted at Galveston, Tex.; Philadelphia; Baltimore; Cleveland; and Paulsboro, N. J. Nine out of the 10 bulkheads studied by the "hinge at dredge line" procedure produced results that agree closely with measured values—the one exception being a case where there was very soft to soft clay beneath the dredge line.

It appears desirable to roll heavier steel sheetpiles in this country, similar to the heavier sections that are available in Europe. The Krupp V and Hoesch V "Z"-type sections have section moduli some 19% greater than our heaviest corresponding (MZ-38) sections. The European steel sheet would permit 37 ft water depths where U.S. sections would permit only 33 ft. This situation should be remedied in the U.S.

Evidence points toward continuing future use of the Wiegmann inclinometer. The Port of New York Authority and the Department of Civil Engineering of Princeton University, have formed a year ago a "Joint Cooperative Research Venture", for the purpose of studying by means of inclinometer measurements the behavior of Pier 11, now under construction in Brooklyn, N. Y.

TABLE I

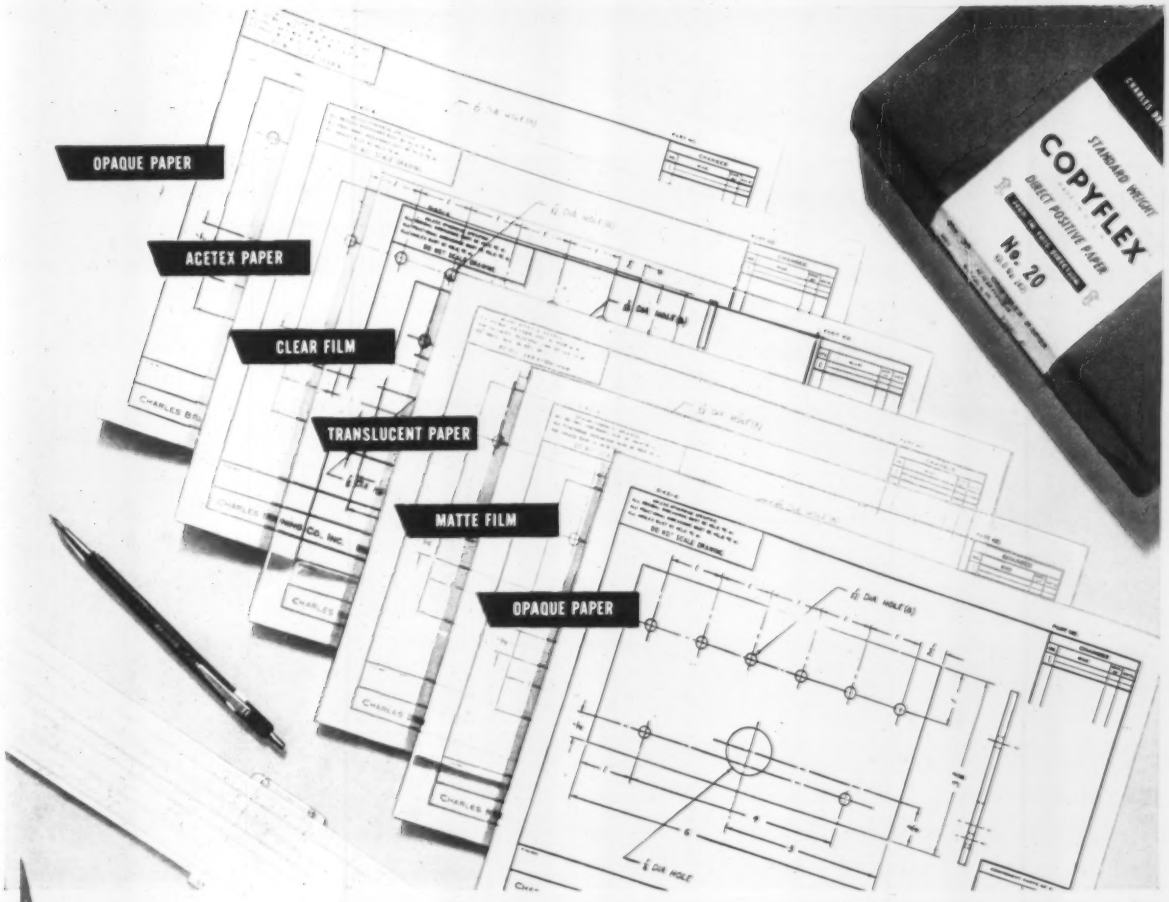
ϕ^α	δ°	M = 0 at elev. −35′			M = 0 at elev. −28.5′		
		Elev. of Mmax	Mmax in-lb	M-18′ in-lb	Elev. of Mmax	Mmax in-lb	M-18′ in-lb
30	0	14 8′	1,289,000	1,249,000	−12.6′	964,000	835,000
35	30	−14 7′	832,000	804,000	−12.7′	626,000	540,000
38	30	−14 5′	701,000	670,000	−12.5′	529,000	454,000
40	30	−14 4′	631,000	600,000	−12.6′	489,000	420,000

TABLE II

ϕ^α	δ°	M = 0 at elev. −35′			M = 0 at elev. −28.5′		
		Elev. of Mmax	Mmax in-lb	M-18′ in-lb	Elev. of Mmax	Mmax in-lb	M-18′ in-lb
30	0	−16.5′	1,620,000	1,608,000	−13.3′	1,064,000	961,000
30	30						
40	0	−15.1′	878,000	853,000	−12.8′	635,000	557,000
40	30						

VALUES OF THE MAXIMUM MOMENTS and the moments at El. −18 for ϕ and δ and two assumptions locating the point of contraflexture are presented in the tables above.

Bulkhead No.	Location	Built in Year	Type of Sheeting	Section Modulus "S" (n^3 ft)	Moment of Inertia "I" (n^4 ft)	Total Length "H" (ft)	Freeboard "a" (ft)	Water Depth "h_w" (ft)	Embedment "D" (ft)	a/H	D/H	$\rho = H^4/(EI)$; $\left[\frac{n^2}{lb}\right]\frac{1}{ft}$	$\log \rho$; $\left[\frac{ft^2}{lb \cdot n^2}\right]\frac{1}{ft}$	M M_{max} (%) (M after Rowe)	M M_{max} (%) (M for hinge at dredge line)	Maximum Stress measured in sheet piling (psi)	Remarks
1(A)	New York	1952	ZP38	46.8	281	65	8+4	35	22	0.18	0.34	42.5	−2.68	40	34	11,350	Old Crib behind upper part of sheeting
2(B)	Galveston	1954	HIV	40.9	215	65	10.5	32	22.5	0.16	0.35	55.5	−2.57	37	53	19,000	
3(C)	Galveston	1951	MZ38	46.8	281	65	10.5	32	22.5	0.16	0.35	42.5	−2.68	40	51	10,200	Timber relieving platform behind sheeting
4	Galveston	1951	L.VI	78.1 23.1	672 201	65	10.5	24	30.5	0.16	0.35	17.7 59.6	−3.05 −2.53	52 36	41	14,700	
5	Philadelphia	1951	ZP38	46.8	281	60	13.5	30	16.5	0.23	0.28					77,000	Sheeting pulled back to straighten alignment
6	Paulsboro, N.J.	1952	ZP38	46.8	281	48	8	20	20	0.16	0.42					3,700	Timber sheeting (intact) behind steel sheeting
7(D)	Baltimore	1950	MZ38	46.8	281	60	8	40	12	0.13	0.20	31.0	−2.72	43	61	28,700 13,500	
8	Baltimore	1952	ZP38	46.8	281	50	8	28	14	0.14	0.28	15.4	−3.13	55	68	17,000	
9	Cleveland	1940	MZ32	38.3	220	48	6	25	17	0.13	0.35	18.5	−3.05	52	43	17,900	
10(E)	Cleveland	1954	MZ38	46.8	281	60	6	24	30	0.10	0.50	31.0	−2.72	46	27	16,000	Heavy Surcharges



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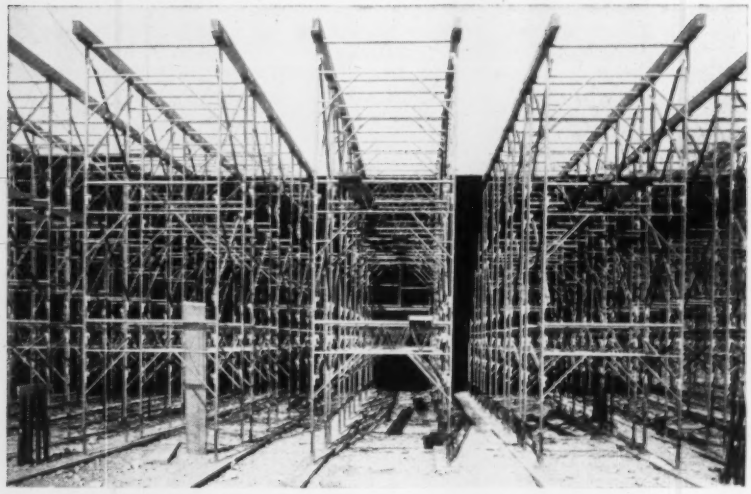
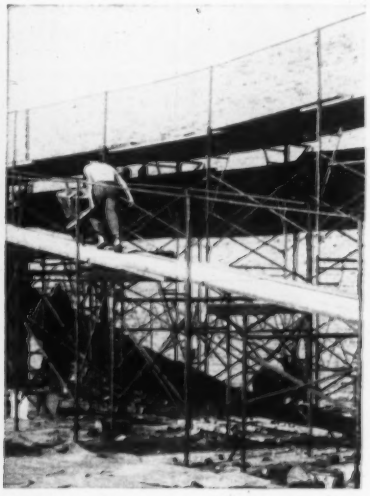
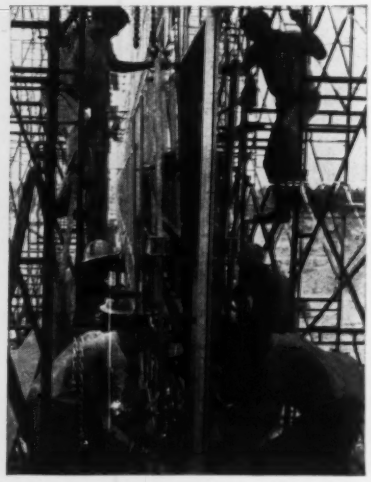
Scaffolding Methods . . . by Patent Scaffolding Co.



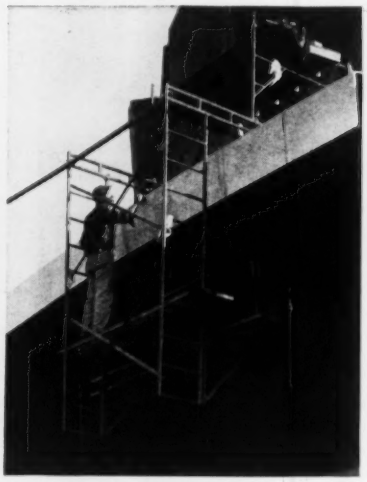
PREFAB SHORING FOR 12" SLAB—On a new 150' x 350', two-story building for Polaroid Corp., Waltham, Mass., general contractor Aberthaw Const. Co. needed support for a 12" slab. 4000 "Trouble Saver"® Shoring frames assembled in rows 3' and 3'6" apart easily provided for it. Job supt., Al Parsons, Jr.. says "We found these shoring frames, braces and components very easy to handle. We know that this type of shoring goes up faster, cuts costs and gives us maximum access to the base slab for other work".



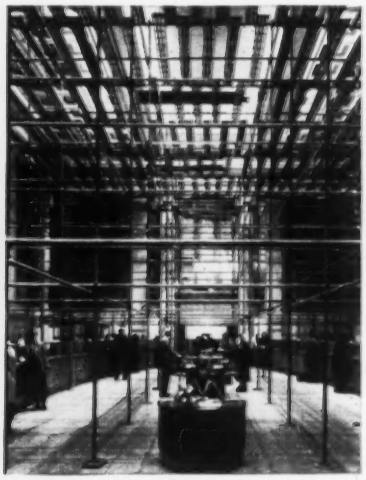
DOUBLE-DUTY—Both the wheeling ramp and the mason's platform in back are made from prefab sections of "Trouble Saver Scaffolding. Varying-height frames and adjustable legs achieve the slope. Terminal Construction Co., Woodridge, N. J., general contractor.



GLASS SETTING RIG—A special rig, developed by Pittsburgh Plate Glass Co., with 700 "Trouble Saver" Scaffolding frames for working platforms, places 8' x 11' glass panes for Conn. Gen. Life Ins. Co. new building, Hartford. Eight rubber cups grip panes, overhead crane lifts to position. Turner Construction Co., general contractor.



ROLLING SCAFFOLD—Unusual set-up is made of two 5'-wide, counter-weighed "Trouble Saver" Scaffolding frames on casters. 12'-trusses are attached and ladder frames hang below. Sidewall brackets make two-level platforms. Scaffold rolls around roof perimeter of new Dallas Memorial Auditorium. R. P. Farnsworth & Co., gen. contr.



BANKING AS USUAL—Smoke damage due to fire made a wash and paint job necessary at the Marshall and Isley Bank, Milwaukee. Painting contractor, Carl L. Ruhland, used "TubeLox"® Scaffolding with Featherweight Stages to provide working platforms for ceiling and high wall work above and to permit banking traffic as usual below.

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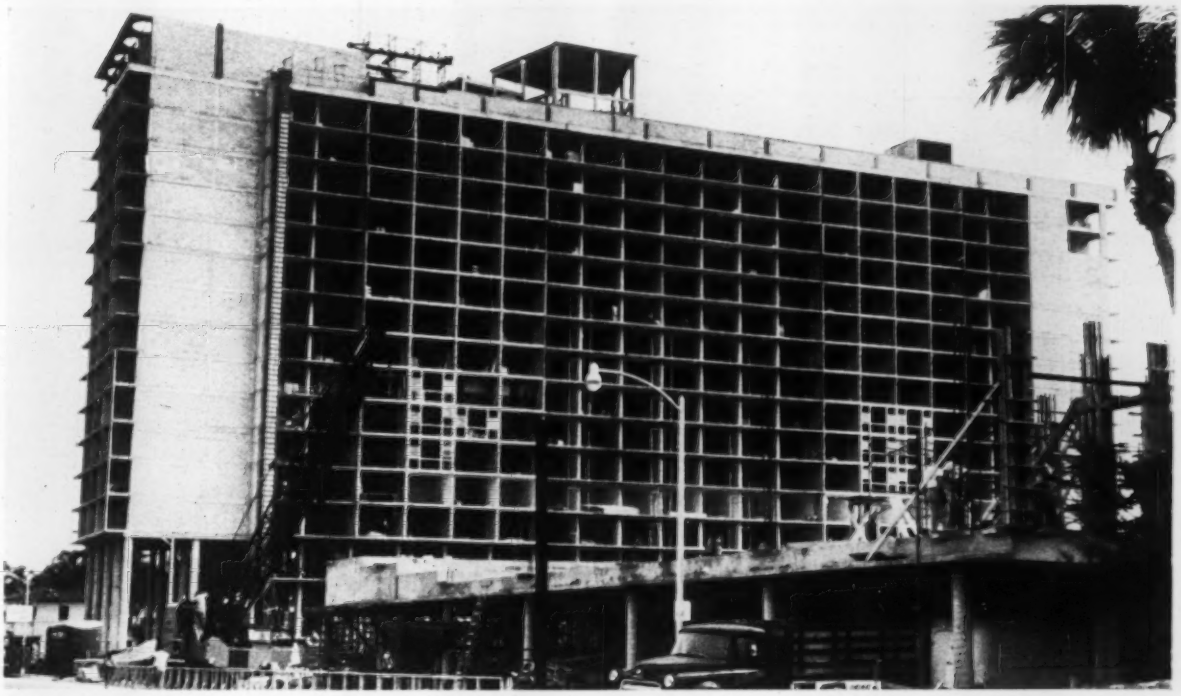
To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.



For Miami Beach's new 670 room Carillon Hotel . . .

Flat-plate Floors Gain Time and Space

Jacob Feld
Consulting Engineer
New York City

Miami Beach's newest and biggest hotel, the 670 room, 15 story Carillon, claims the distinction of being the first hotel in the South Florida resort city to be designed and built with flat-plate reinforced concrete floors. Two important results of the innovation were fast construction and an extra story in height.

The plain unribbed underside that characterizes the slab in flat-plate construction was maintained closely, beams being provided only at stairs and elevator shafts. This geometric simplicity plus uniform sizes for shear walls and columns throughout the height of the building permitted slab pours to proceed on a 4 day cycle. Including the lobby, roof and 14 sleeping floors, 16 tiers were cast in three months.

Typical Miami Beach design in concrete is one-way rib slab between beams. With the established minimum ceiling height of 8½ ft for Florida hotels, this system would have allowed only 14 stories within the maximum building height permitted in the zone containing the hotel site. But the adoption of 6 in. flat-plate floors made room for another story.

• Other systems studied—Before making the design, we determined by a comparative study that the flat-plate system would be preferable to either slab-band or slab with beams at partitions, two other structural schemes that also would have permitted an extra tier. Slab-band was ruled out because it would have required an extra 500 lb of steel reinforcing bars per 13 x 33 ft room (see table below). Slab-beam promised a $73 saving based only on the cost of concrete, forms and steel; but additional plaster surface and edge beads on the beams would have eaten up $55 of the saving. Besides, the beams would have had to cross the corridors every 13 ft, which would have forced the air ducts and hung ceilings in the corridors too low. The flat-plate system was, therefore, selected.

• Shear walls take wind—Wind load for the Miami area is 45 psf over the entire exposure of a structure. Transferring from slabs to columns the stresses due to wind on the long narrow—318x65½ ft—tower would have involved considerable congestion of reinforcement and deeper sections. It was decided, instead, to introduce concrete shear walls across the tower to take the full wind moments and to treat the slabs as horizontal plates between the walls.

Stair and elevator shafts being favorably located for extra duty in resisting shear, they were enclosed with 8 in. concrete walls. Similar walls were carried across in the transverse direction between apartments and spaced so that in plan the resultant of shear-wall resistance occurs at the center of the tower's length. Most of the walls were increased to 12 in. thickness in the lowest stories, and the columns located along the shear-wall lines were omitted.

Columns were made the same size from top to bottom of the building both to keep slab-shear values low around the columns and to save on formwork. This detail, plus favorable concrete test results that permitted stripping the columns in 48 hr, speeded the job by allowing column forms to be used as many as three times in one week.

With a specified design strength of 3,000 psi, the concrete tested consistently 4,000 psi at 28 days.

(Continued on page 52)

Quantities

Per 13 x 33 Foot Room

	Flat Plate	Slab-Band	Slab-Beam
Concrete, Cu Yd	9.1	9.1	7.8
Bottom Forms, Sq Ft	429	429	429
Side Forms, Sq Ft	7	7	104
Column Forms, Sq Ft	105	105	100
Steel Bars, Lb	1,900	2,400	1,350

Steel strapping's ideal for jobs like holding these temporary supports in place.

Model 3A heavy-duty stretchers illustrated. Other models available for lighter duty or special use.

Model C heavy-duty sealers illustrated make it easy to apply seals to heavy-duty strap.

Model CU-25 cutters easily sever any strap, including 2" x .050". Other models available for lighter duty.

Use Signode steel strapping to speed and simplify tying, holding, handling

The tools are simple, rugged, dependable. The methods, as one user wrote, "are just common sense." Savings in concrete column form tying regularly run to about one-third over other conventional methods. But when you have Signode tools and steel strapping on the job, you can save on all these other jobs, and more:

- *Tying foundation wall forms*
- *Tying grade beam forms*
- *Tying forms for fireproofing steel beams*
- *Reinforcing of scaffolding*
- *Holding support timbers in place*
- *Bundling materials for loading, moving, handling...lumber, brick, reinforcing rod, wall panels, holding down machinery, etc.*

The Signode man near you can help you get the tools and strapping you need from the complete Signode line...can help you with methods if you wish. Call him today, or write:

STRENGTH TABLE—SIGNODE STRAP REPRESENTATIVE STRAP SIZES

Strap Size	Approx. Strength in Pounds	Approx. Cost per Foot*
⅝" x .020"	1,250	0.7¢
¾" x .023"	1,725	1.0¢
¾" x .035" HD	3,100	1.5¢
1¼" x .035" HD	5,000	2.4¢
1¼" x .050" HD	7,000	3.1¢
2" x .050" HD	11,000	5.0¢

*Zone 1, 1-Ton Prices

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. . . Hotel piles go to rock

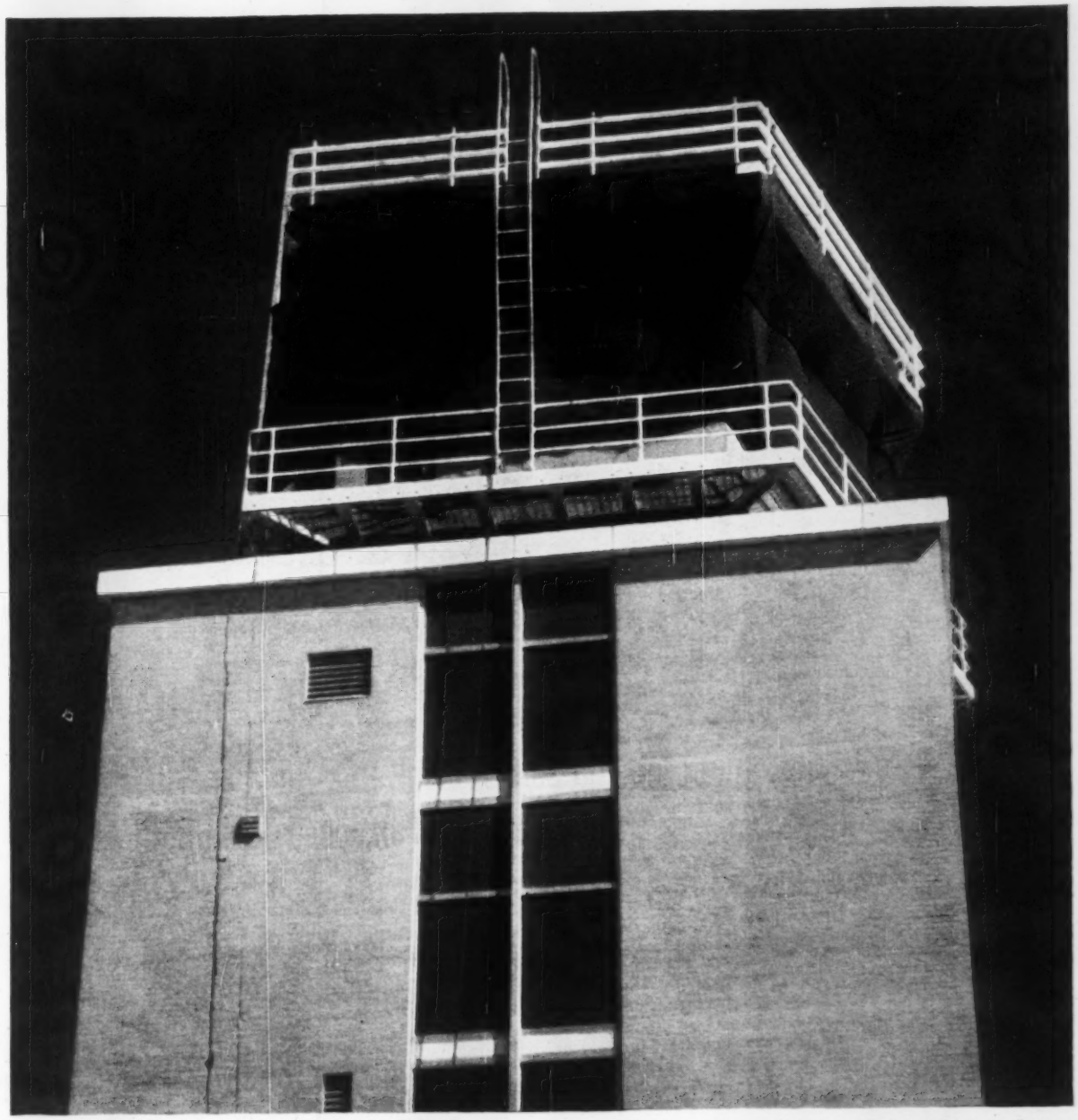
DUMBBELL-SHAPED shear-wall footing reflects pile arrangement beneath it.

• **Piles vary from the usual**—Piles for the hotel are 14x14 in. precast concrete 36 ft long, driven to end bearing on coral rock. This contrasts with the local practice of using short friction piles. Almost all Miami Beach structures rest on 12 in. or 14 in. precast concrete piles 16 to 25 ft long, jetted and driven into sand fill. Typical capacities are 20 to 25 tons per pile, determined by static load tests.

We tested three piles, all with a 10,000 ft-lb single-acting steam hammer. A 20 ft, 12x12 in. precast concrete pile was jetted down 10 ft, driven fairly readily down to 18 ft and driven the final 2 ft with 2 blows per inch. Allowable capacity under the local code was 20 tons. A 36 ft, 14x14 in. precast concrete pile was driven to a final resistance of 7 blows per inch. Allowable capacity was 40 tons. A 12 in. corrugated steel shell driven into the rock showed a final resistance of 10 blows per inch. Allowable load was 40 tons or more. On the basis of material costs, we picked the 14x14 in. pile.

Total design weight of the building is 3,400 lb per sq ft, one-third of which is live load, and very few additional piles were needed for wind at the 125% loading permitted under combined loads. Piles under the shear walls were spaced dumbbell fashion—concentrated under the ends of the walls, scattered under the middle—to provide economically the necessary resistance to wind moments.

• **Designers**—Architects for the project were Joseph Vladeck & Abraben, of New York City, associated with Norman Giller & Associates, of Miami Beach. The tower design was prepared by the writer, with Abraham Blumberg as designing engineer in charge. James L. Sloan, at first on the staff of the local architect and later as an independent engineer, developed all reinforcing and concrete details.



A TOWERING USE FOR CANVAS—The several new buildings now under construction at Moisant International Airport are adding a distinctively modern touch to the New Orleans area. A striking example is this control tower, high above the new $7,000,000 terminal building. During its construction, the partially completed interior of the tower had to be protected while the contractors awaited delivery of special Thermopane® glass panels. For this purpose, the J. A. Jones Construction Co., contractors, employed a large number of all-weather tarps manufactured by The Foster Company of New Orleans and made from Mount Vernon Duck.

This is another example of how fabrics made by Mount Vernon Mills, Inc., and the industries they serve, are serving America. Mount Vernon engineers and its laboratory facilities are available to help you in the development of any new fabric or in the application of those already available.

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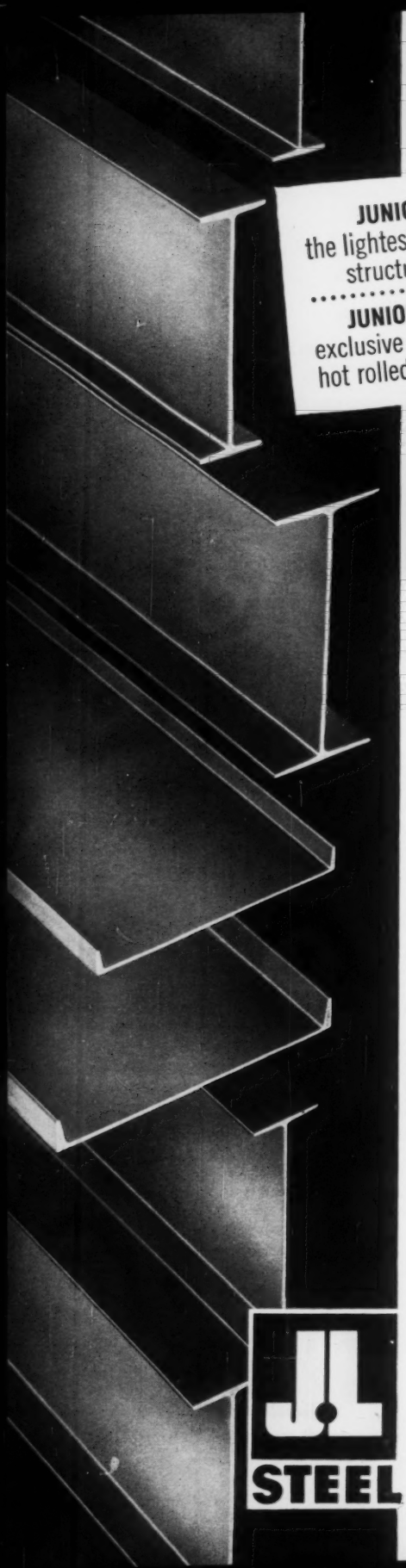

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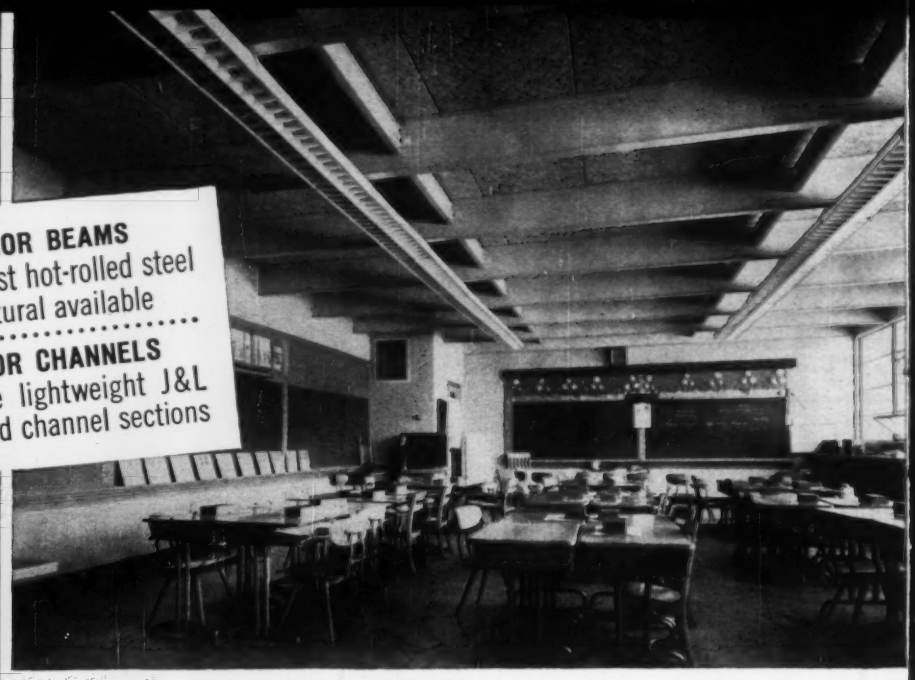
JUNIOR CHANNELS
exclusive lightweight J&L hot rolled channel sections



Architect: Hill and Wupper, Inc. • Fabricator: Geiger & Peters, Inc.
Contractor: Cannon Construction, Inc.

"LET THE STEEL SHOW"

Indiana school illustrates functional beauty and practicability of exposed JUNIOR BEAMS

"School board members like the functional use of exposed Junior Beams in this Warren Township Elementary school," reports Hill & Wupper, Inc., AIA, Architects and Engineers, Indianapolis.

This trend to exposed steel construction is finding wide application across the country in schools, residences, shopping centers and other light occupancy structures. Versatile JUNIOR BEAMS can be adapted to a wide range of architectural designs.

JUNIOR BEAMS are economical to use. They reduce steel tonnage required and they cut labor costs because they are easily fabricated, raised and positioned.

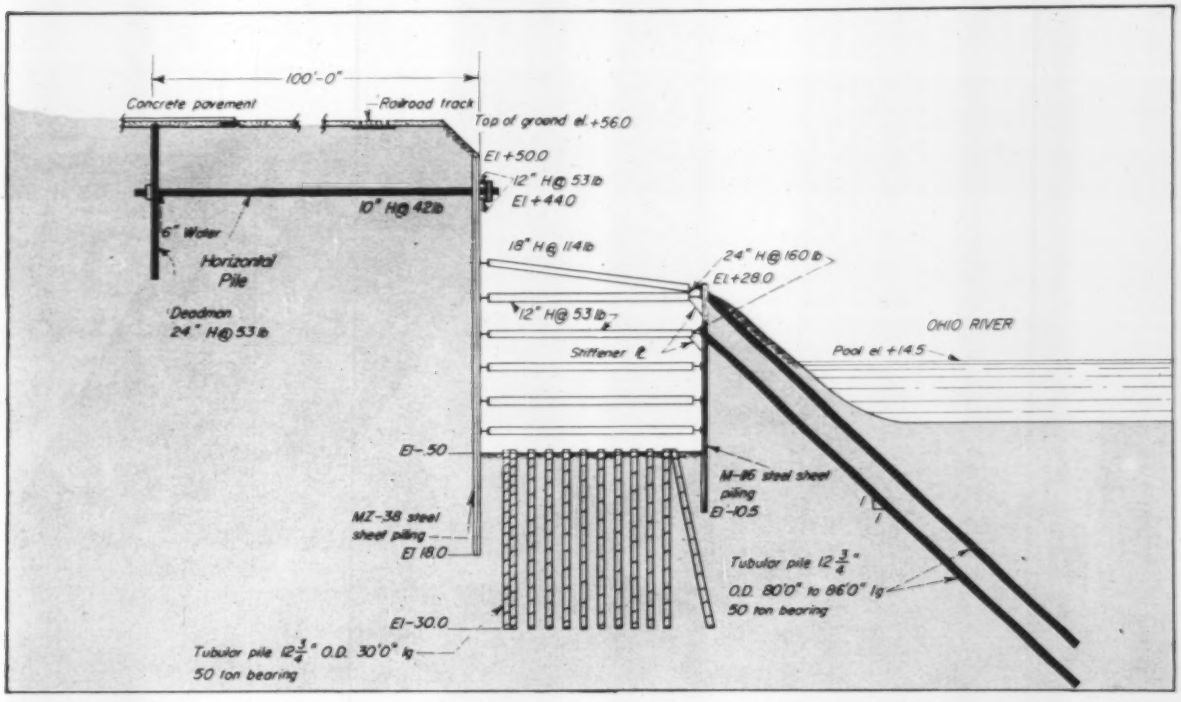
Get complete data on these and other J&L lightweight structurals. Call your local warehouse or write Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

35 tons of 12" JUNIOR BEAMS were used in this Warren Township Elementary School, Indianapolis, Ind. The exposed beams were covered with 3" Tectum insulation, which was topped with roofing. Modular design has windows and columns on 4' centers.

J&L STEEL

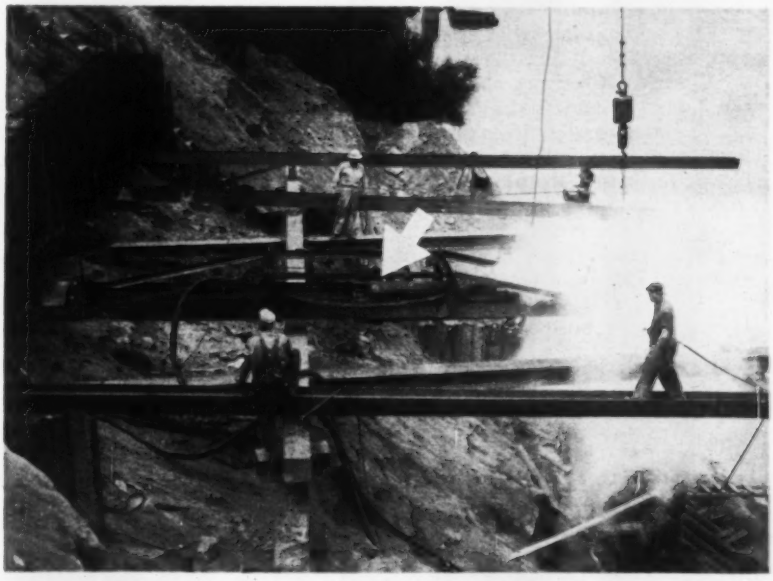
Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA



COFFERDAM WALL on river side is supported by piles driven at 45 deg angle into bed of Ohio River at Owensboro, Ky. Lower portion of land side wall is supported by system of struts. Upper portion of wall is carried by piles driven into hillside.

Horizontal Piles Brace Cofferdam Wall



HORIZONTAL PILES are driven into bank through holes cut in the upper wall sheeting. Hammer (arrow) and leads are carried by crane set on barge in the river.

To brace the high inside wall of a river-bank cofferdam, Contractor Harry O. Wyse, of Lexington, Ky., drove piles horizontally into the river bank, welded them to deadmen 100 ft behind the bank face, and then connected the piles to walers running along the interior of the cofferdam wall.

The cofferdam, needed to allow excavation and pile driving for a sewage pump station at Owensboro, Ky., on the Ohio River, measures 41 x 52 ft. Located in the middle of a 1:1 slope, the landward wall carried a heavy load with nothing to brace against on the river side. Excavation was to be carried 20 ft below normal river stage into 25 ft of quicksand formation.

A line of MZ-38 steel sheet piling, making up the inside wall of the cofferdam, was driven parallel to the top of the bank. The other walls are made up of M-116 sheeting. To brace the cofferdam, a double row of 13 in. dia piles was driven 80 to 86 ft on a 45 deg batter into the river bottom to obtain a 50 ton bearing. These piles brace the river wall of the cofferdam. Then,

Profits Go Up On Every Job

With fabricated I-beam frame for rugged durability and top load-carrying strength on roughest possible terrain.

With 88" of inside width and a complete range of body and chassis lengths to provide the loading capacity you need.

A MORE RUGGED, LOW COST Dump Trailer than the new Fruehauf "Toughy" has never been built for profit-conscious, cost-conscious roadbuilders!

Its bridge-type fabricated steel I-beam chassis frame construction is your assurance of durable and constant service under maximum payloads on all kinds of terrain. Extra years of performance are actually *built-in* the Toughy—and that adds up to extra dollars of earnings for you.

Tandem and single axle units in a broad range of body and chassis lengths are available to suit your weight distribution requirements. Capacities range from 8 to 26 cubic yards. In the longer tandem axle unit, bridge formula design can be applied to provide you with maximum legal capacities. Low or high sides can be chosen—inside width is 88" in either case. Wide front coupler and no-hop P2 tandem are exclusive Fruehauf features.

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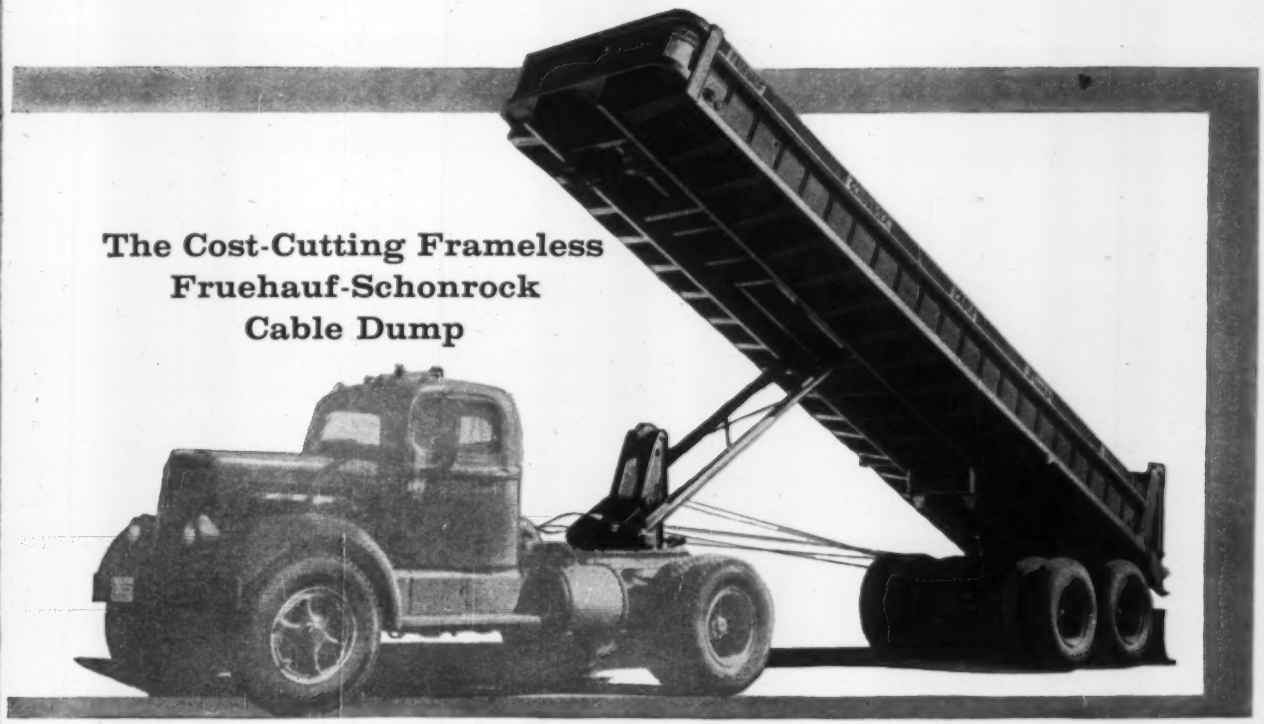

With redesigned booster fifth wheel for faster dumping with less strain on truck and cable than ever before.

With redesigned body frame for greater strength and increased "flex" in center beam to absorb even the greatest shock loads.

STILL THE MOST ECONOMICAL Dump Trailer in America to purchase or maintain, the simply-designed, ruggedly-built, frameless Fruehauf-Schonrock Cable Dump now has more cost-cutting, time-saving features than ever!

Faster dumping with less strain on truck and cable is achieved by new, longer booster arms and larger rollers. Higher stockpiles are provided by newly-designed offset tailgate hinges, which swing the gate quickly out high and clear of the pile. Shock loads of all kinds are more easily absorbed by the tougher, more flexible body frame.

The cost of this revolutionary cable unit still remains lower than that of most competitive hoist units with or without full chassis frames. Payloads are still up to 4,000 lbs. greater because of the frameless design and bridge formula application. All wheels stay fully grounded throughout dumping, and the cables can be used to get either truck or Trailer out of mud or holes.

No other dump of any kind does so much work for so little cost!

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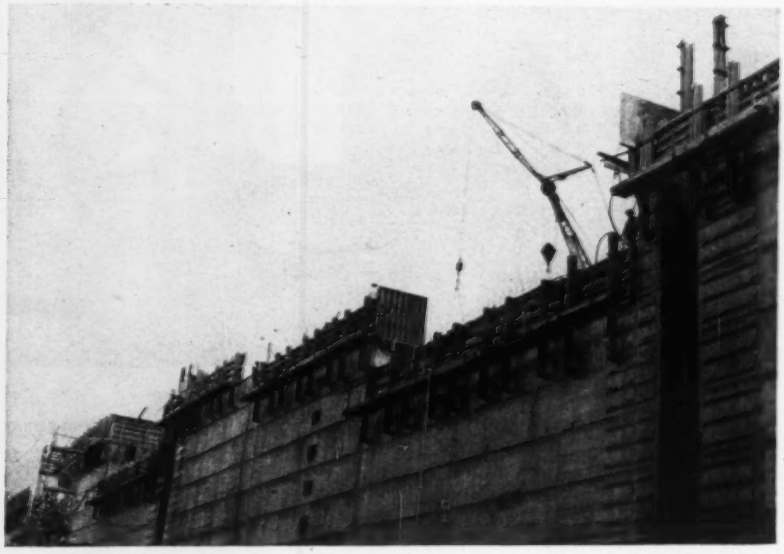
through a system of 12H53 struts, the support was carried to the lower portions of the inside wall.

The original plan of supporting the upper part of the wall by means of cables connecting deadmen and a top waler on the wall was abandoned. Digging cable trenches in the sandy soil required an excessive amount of excavation. Instead, horizontal piles were driven as anchoring tie rods.

• **Horizontal driving**—Two cranes were used to drive the piles into the bank at an angle 2 deg above the horizontal. One crane on a river barge supported a 9B3 hammer and its leads. At the same time, a crane on the bank above the cofferdam maintained a constant pressure of the hammer against the end of the pile by means of a snatch block and tackle.

Five 10H42 piles were driven 100 ft in the bank. Each pile was welded to two 12 ft long 12H53 deadmen driven vertically on each side of the tie-back pile.

Within the cofferdam two 12H53 beams were placed, one above and one below the horizontal piles, to act as walers. The lower waler was prestressed to 60 tons by cutting a slot in the web of each pile and dropping an 18 in. needle beam through to take the reaction of two hydraulic jacks acting against the waler and transferring it to the pile. Channel iron stubs then were welded to the pile and walers to complete the joint.



CANTILEVER FORMS have panels to hold steel armor so it can be cast integrally with lock walls. Armor is placed to keep barges and tows from scouring concrete.

New Concrete Form Holds Lock Wall Armor

A new type of steel form, designed to hold steel armor in place while it is integrally cast with the walls, has been successfully introduced at the Greenup Lock job on the Ohio River (and subsequently at other current lock work in the U. S.).

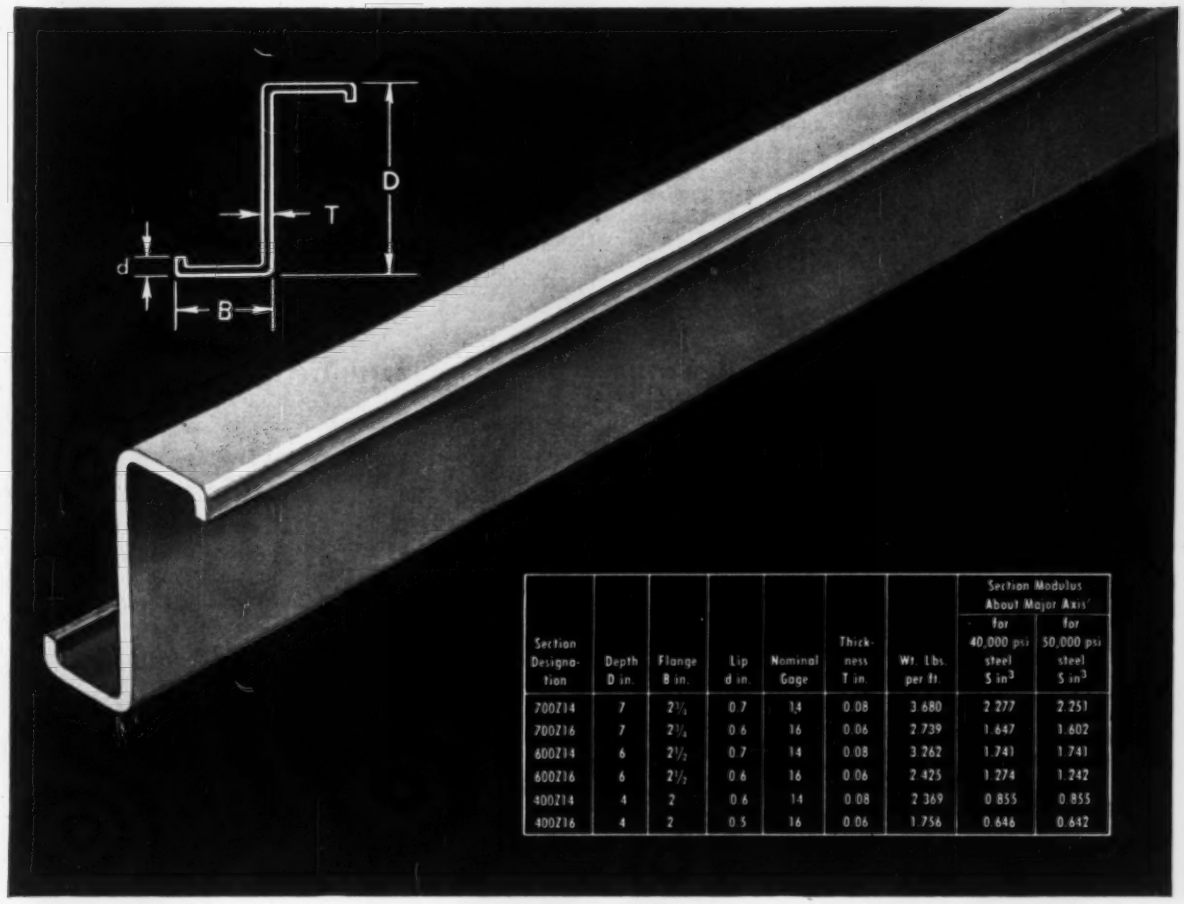
Armoring is placed in approaches above and below lock gates, at recesses in the walls, and, generally, wherever a barge or tow would most likely bump.

The basic form used at Greenup is a steel cantilever unit to accommodate 5 ft lifts. To place the armor, three horizontal panels of the correct height are incorporated in each 5 ft form panel. The panels slide within the face of the form providing for any armor length—in this case 1½ ft to 55 ft long.

The armor, of modified T-section 7¾ in across the face, is inserted through the face of the form and attached with one or more clips. The clips are mounted on the form, thus simplifying matching clips with holes. A bolt is inserted through the clip and the armor is fastened by a nut. After the concrete is cast, the bolts are unscrewed and the armor remains firmly embedded in the concrete.

Some 400,000 cu yd of concrete is being placed by the Guy F. Atkinson Co.-United Construction Co, joint venture for two locks at the Greenup site, 143 miles above Cincinnati. The new forms were developed for this contractor by Blaw-Knox Co.

(*Field & Office continued on p. 60*)



Section Designation	Depth D in.	Flange B in.	Lip d in.	Nominal Gage	Thickness T in.	Wt. Lbs. per ft.	Section Modulus About Major Axis for 40,000 psi steel S in^3	Section Modulus About Major Axis for 50,000 psi steel S in^3
700Z14	7	2 3/8	0.7	14	0.08	3.680	2.277	2.251
700Z16	7	2 1/4	0.6	16	0.06	2.739	1.647	1.602
600Z14	6	2 1/2	0.7	14	0.08	3.262	1.741	1.741
600Z16	6	2 1/2	0.6	16	0.06	2.425	1.274	1.242
400Z14	4	2	0.6	14	0.08	2.369	0.855	0.855
400Z16	4	2	0.5	16	0.06	1.756	0.646	0.642

announcing PENN-ZEES

a new LIGHTSTEEL framing section by Penn Metal

New, high-tensile **PENN-ZEES** are designed for fast, efficient, low-cost intermediate framing of metal-clad buildings. They are ideal for use as purlins, for spans from 16′ to 24′ between trusses, rigid bents or beams; and for side and end wall horizontal framings and girts.

PENN-ZEES are made in 4″, 6″ and 7″ depths in both 16-gage and 14-gage steel. They are available in either structural-grade or commercial-grade steel, with minimum yield points of 40,000 psi or 50,000 psi, respectively.

When required, flanges and webs will be punched with 9/16″ holes. Flange punching is designed for bolting the sections to rigid bents or trusses, and web punching is used for quick insertion of sag rods or horizontal bracing. Steel roof decking, siding or corrugated sheets can be attached to **ZEES** with self-tapping screws, or by other conventional methods.

This new section is well worth looking into. Send for new **LIGHTSTEEL** catalog, which gives properties and loading tables for **PENN-ZEES**.

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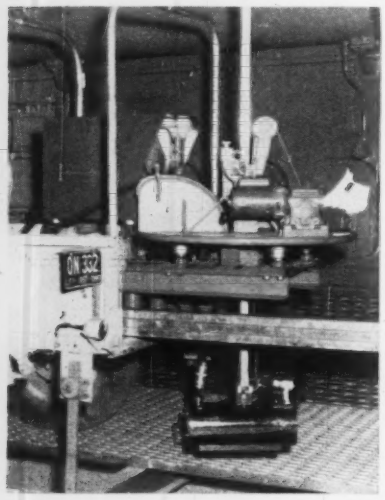


Underground Piping Checked by Portable TV

Cincinnati is using a closed circuit TV system to inspect hard-to-reach underground facilities.

The municipality's sewage department has mounted a television camera, monitor and power generator on a utility trailer so that the closed system can be used anywhere the trailer can be placed.

The camera, the size of a cigarette carton, is enclosed in a waterproof steel case with a powerful light source mounted on the case.

The camera is attached to a 12 ft rod that can be raised or lowered into position. With rod sections added, the camera can be lowered as much as 60 ft.

The complete unit, including the TV equipment and the accessories, costs about $7,100. The device is the idea of Arthur Caster, who is head of Cincinnati's sewerage department, and Leo Krapp, who is head of the maintenance section.

The system now is being used for preventive maintenance checks on interceptors, regulators and control chambers in the city's Millcreek Sewage Plant.

Underwater Blasts Curtained, Cushioned

Two new techniques for absorbing the shock of underwater rockblasting are being tried on the Welland Canal in Ontario.

First method (both are patented by Canadian Industries Limited) is use of a "curtain" of air bubbles between the blast and underwater structures to be protected against shock. The air curtain cuts off waterborne shock waves as contractors deepening the Welland Canal blast rock to be excavated.

This technique was used in Canada as much as four years ago and has been used by the Hydro-Electric Power Commission in blasting underwater within 85 ft of an existing powerhouse. In that application, six tons of explosive moved 25,000 tons of rock without damage to underwater portions of the building.

The air curtain has gained acceptance on the Welland Canal as a time-saver, too. It can shield floating rigs from shock, making it unnecessary to move them far away from every blast.

Second device is the air "cushion", use of cans of air inserted in drill holes spotted in a protective line between the blast and underwater features to be protected. Two contractors are using this technique.

Object is to shatter the blasted rock up to and along the line of drilled holes, there the sealed cans of air collapse, cutting off shock waves traveling in the water.

A. La Prairie of CIL is the inventor of both the "curtain" and "cushion".

And while his air "cushion" using cans is being given trial along the Welland Canal, Canadian engineers elsewhere are reportedly considering still another device—ping pong balls.

"Eucnik"—Level-Load Capacity of 80 Cubic Yards

A dump truck with a level load capacity of 80 cu yd is being tested by Western Contracting Corp., Sioux City, Iowa, for use sometime this summer in its closure contract at Oahe Dam. And so successful were the initial tests of the prototype, that the company has already decided to build an undisclosed number of additional units. Called the "Eucnik", the 14 ft high behemoth is the result of planning by Western and design by the Charles W. Jones Engineering Co., Los Angeles, Calif.

Basically the 18 tired earth-toting monster is an offspring of a 35 yd Euclid Model LLD rear-dump truck. Engines, cab and frame from an LLD were modified to make the tractor portion of the Eucnik. The two 300 hp Cummins diesel engines are equipped with turbo-superchargers to step up power rating to over 375 hp.

Some of the Eucnik's other massive measurements are: length of box, 46 ft; outside width of box, 15½ ft; total weight empty, 78½ tons; total weight loaded, 199½ tons, hydraulic box hoist, 21 in. dia, three section, extending to 13 ft; height with box at extreme dumping angle, 45 ft.

Western officials say that the truck—which has an estimated top speed of 35 mph—would probably be most valuable where long hauls are required and where haul roads are in relatively good condition.

Tru-Stop Brakes

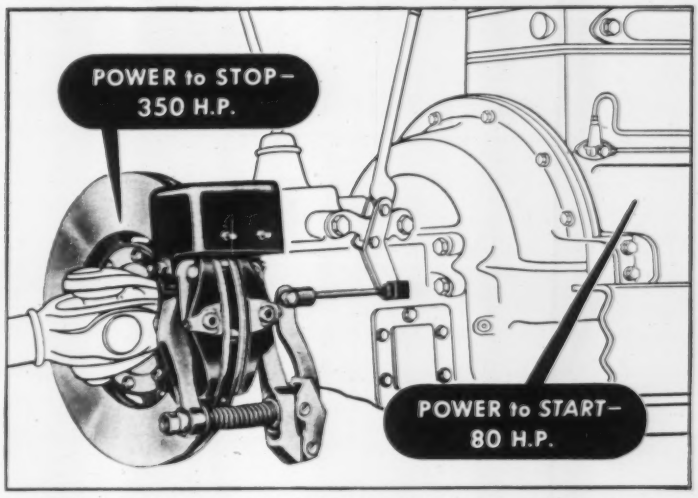
Meet Every Heavy-Duty Safety Requirement

OFFER POSITIVE PROTECTION AGAINST RUNAWAY OR PARKING ACCIDENTS—AT LOWEST COST

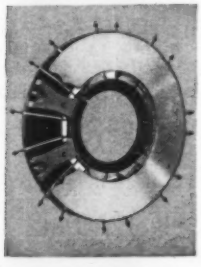
HERE IS WHY:

They have surplus power required for emergency service—no dangerous self-energizing

TRU-STOP Heavy-Duty Emergency Brakes are not only excellent parking brakes. They serve as a complete, independent and fully reliable braking system. Operating on the propeller shaft they enable the driver to continue on safely in the event of service brake failure. TRU-STOP brakes have the surplus braking capacity to be used *repeatedly* as an auxiliary to service brakes.

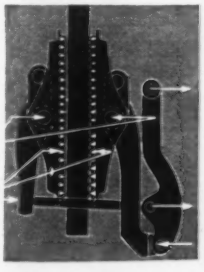


Brakes actually do more work than the engine in terms of horsepower Where it takes 80 HP to accelerate to 20 miles per hour, it takes 350 HP to make a safe stop from 20 miles per hour within required limits



Ventilated to throw off heat

Brake efficiency depends on ability to throw off intense heat —rapidly. Discs of TRU-STOP brakes are exposed to the air even during the braking operation. Ventilated design circulates air *between* the disc plates.



Give uniform brake pressure

Disc of TRU-STOP brakes is "squeezed" between the flat surface of the shoes. Effort applied to brake lever operates front and rear lever arms simultaneously. Pressure is exerted on the center of each shoe. Entire lining surface is in contact.

FOR SAFE, ECONOMICAL, HEAVY-DUTY BRAKING WITH MAXIMUM LIFE AND MINIMUM MAINTENANCE

TRU-STOP Brakes are used on a great variety of mobile and stationary equipment

SUCH AS—

- Motor cranes
- Road rollers
- Dump trucks
- Power dividers
- Cooling tower fans
- Oil well pumps
- Cold header presses
- Scrubbing machines
- Wire rope stranders
- Fork lift trucks
- Motor scrapers
- Tractors
- Graders
- Diamond core drills
- Electric locomotives
- Oil well servicing rigs
- Railway inspection cars
- Shapers
- Power take-offs
- Winches
- Motor shovels
- Tractor loaders
- Conveyors
- Hard rock drill positioners
- Mine locomotives
- Power presses
- Railway power ballisters
- Cable tool spudders
- Aerial tram cars
- Tension wire stringers

We will be glad to answer any questions or give you more detailed information about TRU-STOP Heavy Duty Emergency Brakes. Send for Catalogs DH-33 and DH-530

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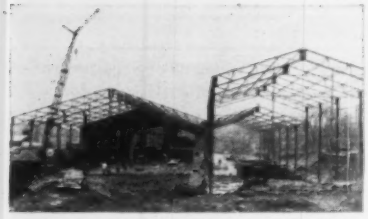
ACCO

Need a building ...FAST?

SWISS-LOK Tubular Building Frames offer these exclusive advantages:

Vastly cut erection time, crane service and labor costs
No welding, cutting, riveting or bolting at the site
One-third less weight without strength sacrifice



One crane is sole equipment needed and its time is ⅔ less because of fast SWISS-LOK connections.

Using the patented SWISS-LOK, all structural parts slip together quickly, providing a rigid structure that meets all A.I.S.C. requirements. The SWISS-LOK "keystone" permits wide spans without center columns.

The rigid-type truss chords parallel the roof slope, providing more overhead space for materials movement and storage.

All new, tested pipe is used exclusively in SWISS-LOK structures.

All structural frame members can be hauled by trailer truck, providing fast delivery, convenient spotting and reduction of handling.

SWISS-LOK structural framing is independent of roofing or siding. Any type may be used and standard wall tying and sheet metal fastening are applicable. There is no reliance upon wall or roof construction for support, alignment or rigidity.

SWISS-LOK structures are applicable to any style building — industrial, warehouse, institutional, public or commercial. For descriptive, illustrated literature write:

SWISS FABRICATING, INC.
Office and factory
Camp Horne Road, Pittsburgh 2, Pa.

IN THE FIELD this photocopying unit can be placed directly over bound volumes of land records required in the preparation of highway right-of-way maps.

IN THE OFFICE the same unit, used within its carrying case, can do the more conventional jobs found in a consulting engineer's office.

Cut Costs With a Photocopier

The copying of land records is one of the major bottlenecks with which a consulting engineering firm must contend when preparing highway right-of-way maps. However, Goodkind and O'Dea, a New York City firm, found that a portable photocopying machine is an effective tool for eliminating that time-consuming chore.

Prior to making use of the photocopying unit, the firm would send a team of engineers and technicians to a land record office and there copy by hand the deeds of all properties to be crossed by a planned highway. When this task was completed, the handwritten copies were typed and proof-read at the company's office.

But the firm tried a different method. With a portable photocopier manufactured by F. G. Ludwig, Inc. of Old Saybrook, Conn., the firm found it could obtain a permanent record of land deeds at a generous saving in time and cost.

A key feature of the unit, in addition to portability, is a clear plastic inflatable air cushion which presses a sheet of sensitized copying paper over the entire page, following the contours of the bound record from margin to margin. The machine produces a "negative" of the land record page in about eight seconds and development of the negative in the firm's office requires another 22 seconds. But that average of 30 seconds is a huge saving over the former method of copying by hand, retyping and correcting.

And the company reports that each page-copy is produced by the copying unit at a cost of only 8½ cents as compared to $1.35 each by the hand-written and typed operation.

By using the photocopier, only one clerical worker and a junior engineer are required to handle the deed-copying job. The clerk makes the actual copies while the engineer locates the pertinent records.

• **Other benefits**—The engineering firm also reports subsidiary advantages of the unit.

• Error is eliminated as copies are exact and constitute a permanent, accurate file.

• Notations of the map locations can be added by hand to the photocopies of the deeds, thus providing a cross-reference file on property boundaries.

• Along with the completed maps, the photocopies can be turned over to the highway department for their permanent record file.

• **Conventional use**—When not being used in the field, the portable copying unit can be turned to other uses in the office. It can produce copies of correspondence, charts, reports of borings, blueprints and statistical material.

The firm also found it useful in speeding delivery of purchases. When suppliers fall behind on delivery of goods to the company, a photocopy of the original orders is made and attached to it is a note reminding the supplier of the agreed-upon delivery date.

The copying unit is manufactured in three sizes for copies 8 x 10 in, 8½ x 14 in, and 14 x 18 in.

New Athey PW20 dump trailer built 11,000 pounds lighter with USS "T-1" Steel; has lower operating costs and new 3rd (or rear) door design.

Hauls payload over 3½ times its own weight!

—built entirely from USS "T-1" Steel

This new Athey Bottom Dump Trailer is unique. It weighs only 22,500 pounds but has a payload capacity over 3½ times as great: 80,000 pounds. According to the manufacturer, this high ratio of payload to weight is unequaled by any similar equipment.

Trailer weight reduced by 11,000 pounds. That's a lot of weight to take out of a trailer, but the job was done by using USS "T-1"* Steel throughout. This steel has high impact abrasion resistance and nearly three times the yield strength of structural carbon steel. This permitted reduction in plate thicknesses and a weight saving of 11,000 pounds. There was no sacrifice of strength or ability to take punishment.

Ready weldability. The trailer is all-welded, and the USS "T-1" Steel retains its superior strength and toughness after welding—at temperatures even down to 50 below zero. Thus, all parts of the body including the drawbar can be welded without loss of strength.

Build better with USS "T-1" Steel. No other steel possesses the remarkable combination of high yield strength (90,000 psi), toughness and weldability found in USS "T-1" Steel. When you also consider the high resistance to impact abrasion, you have a steel that will save money on construction and mining equipment. For more information, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Remember that we also make USS COR-TEN*, USS TRI-TEN* *and* USS MAN-TEN* *Steels . . . standards for heavy-duty equipment.* *Registered trademarks.

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United States Steel Supply—Warehouse Distributors
United States Steel Export Company

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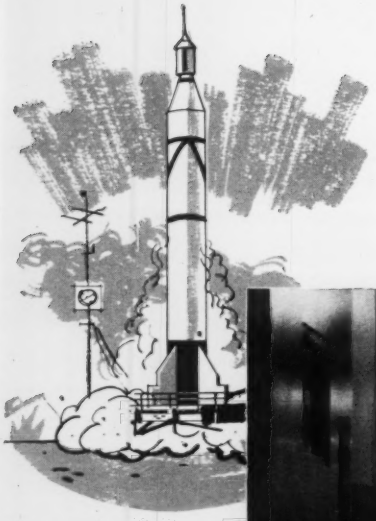


7½ MILES OF SPACE CONTROL

at Patrick Air Force Base...

A typical example of how J-M Transitop panels economically and attractively partition miles of interior space at Patrick Air Force Base.

—with Johns-Manville TRANSITOP® panels

While scientists experiment with shooting missiles into outer space, administrators at Patrick Air Force Base, Cocoa Beach, Florida, are faced with practical problems of enclosing space for earth-bound personnel.

Transitop panels furnished by Johns-Manville—seven-and-one-half miles of them—were used to provide headquarters space needs. These modern panels, used as interior walls, meet the many different requirements for administrative space control.

Transitop, an insulating structural panel, consists of an impregnated core faced on both sides with Asbestos Flexboard®. Panels 4′ wide by 8′ up to 12′ in length are fireproof, rotproof and weatherproof.

Engineered for durability, Transitop is ideal for use as the interior surface for structural walls or as free-standing ceiling height walls. It also provides every requirement for insulated curtain wall construction.

For the complete story on Transitop, write to: Johns-Manville, Box 111, New York 16, New York. In Canada write: 565 Lakeshore Road East, Port Credit, Ontario.

Send for brochure "J-M Asbestos Transitop"

36 pages with illustrated sections on Interior Wall Construction . . . Curtain Wall Construction . . . Roof Deck Construction . . . Steel Framing, Wood Framing, Moulding Systems . . . Design Data . . . Special Applications, etc. It's free for the asking.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

REINFORCED CONCRETE SLAB was no match for pounding sea. Note exposed cutoff steel piling at seaward end of slab.

ROCK DUMPING is emergency action to prevent seawater from undermining retaining wall, street and luxury apartments.

Rio de Janeiro Acts to Save Its Beaches

Protective works for Rio de Janeiro's famous Copacabana-Leme Beaches are proving no match for the continual pounding of Atlantic Ocean waters. Recently, the 26 ft wide reinforced concrete shelf that extends from the toe of a 10 ft high retaining wall began breaking up. This in turn jeopardized some of Rio's fanciest apartment houses built along the beach-front street.

To cope with the emergency, the Brazilian city is taking temporary steps and has embarked on long range studies to find a permanent solution to the beach protection problem which has now bested engineers for the third time.

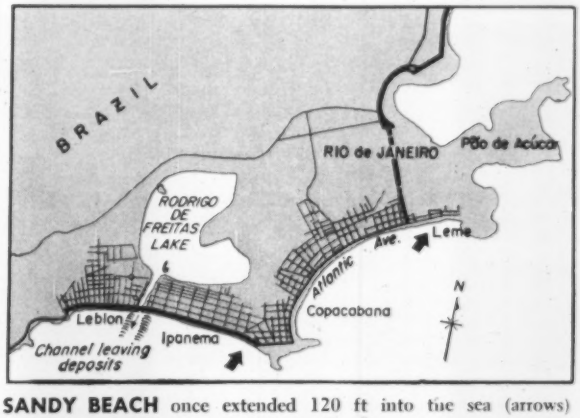
With the shelf, which until last year was covered with sand, now broken up in many places, it is feared the beach-front street and building foundations adjacent to it will be undermined by water eroding beneath the retaining wall. To eliminate the immediate danger, rockfill is being placed at the toe of the retaining wall to retard seepage.

• **History of failures**—In 1919, a thin masonry sea wall and an asphalt walk built in 1905 were washed away. Then a heavier seawall with unreinforced concrete shelf whose seaward end was protected by a wood sheetpile cut-off was smashed in the early 1920s. The present protective works, shown in the drawing, were built in 1925 and functioned satisfactorily until early last year when sand covering the shelf was washed away, exposing about 1,000 ft of slab along the two-mile beach.

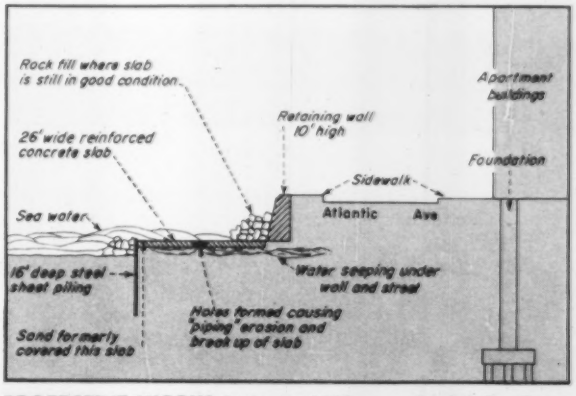
Theories as to why Rio de Janeiro is losing its famous beach line are many. Some engineers in the city say sand is being carried away by currents caused by the constant dumping of earth and rock into the bay area for new land. Others contend that beach erosion at Copacabana is a cyclic meteorological problem.

Rio has now allocated $250,000 for the long range studies which will involve scale models, to determine the cause. A European consultant has been hired.

(International continued on page 66)



SANDY BEACH once extended 120 ft into the sea (arrows) at Copacabana, Leme and Ipanema Beaches.


Rock fill where slab is still in good condition
26' wide reinforced concrete slab
Retaining wall 10' high
Apartment buildings
Foundation
Sidewalk
Sea water
Atlantic Ave
16' deep steel sheet piling
Water seeping under wall and street
Holes formed causing "piping" erosion and break up of slab
Sand formerly covered this slab

PROTECTIVE WORKS built in 1925 recently failed. Long-range studies are now under way to find permanent solution.

In the field of
HYDRAULIC DREDGING

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a leading name for over 50 years

Gahagan Dredging Corporation,
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Write, wire or phone Whitehall
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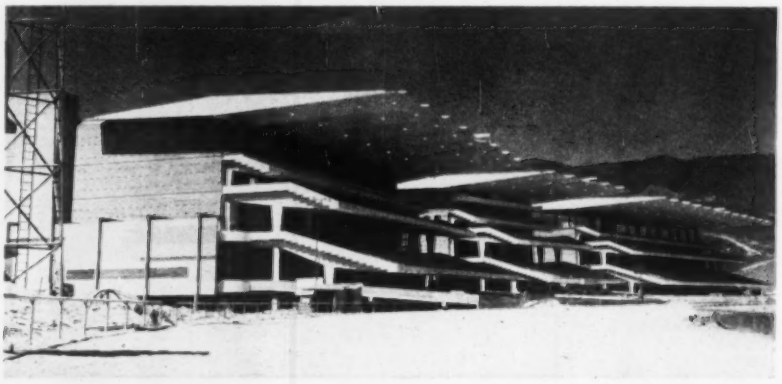

Hamilton Wright photos

Roofs Are Top Attractions at . . .

. . . New Race Track in Caracas

Prof. T. Y. Lin
University of California
Berkeley, Calif.

Prestressed concrete thin-shell roofs just completed for three new grandstands in Venezuela are only 3 in. thick but they cantilever 90 ft.

The structures are located just outside Caracas, at the capital city's new La Rinconada racetrack. When completed later this year, the track will replace the old Hipodromo Nacional nearby.

Besides the reinforced grandstands, which will seat 35,000 spectators, the project will include a 1,600 meter track, an 800 meter training track, and 34 circular stables, each housing 36 horses. Total cost will be $50 million. Oct. 12 (Columbus Day) is the target date for the opening.

Viewed from the front, the shells present a scalloped pattern—30 ft wide inverted arches or catenaries. The depth or sag of the catenaries increases from 2½ ft at the front—the cantilever tip—to 6½ ft at the supports.

The shells are post-tensioned in both directions. Along the cantilever direction, the prestressing cables are housed in tapered concrete edge beams with a maximum depth of 5 ft. Each cable contains 26 wires. In the other direction, the wires curve along the mid-depth of the catenary shells in groups of six every 24 in.

During construction, the cable sheaths were filled first with water-soluble oil to prevent corrosion of the wires, and later with neat cement grout.

Post-tensioning of the edge beams lifted the cantilevers 1 in. off the forms, as had been expected. Eventually, though, creep and shrinkage will relax some of the prestress and let the roof return to its original horizontal position.

The anchor columns were both prestressed and conventionally reinforced, the first to insure elastic behavior when subjected to uplift, the second to increase their ultimate strength against

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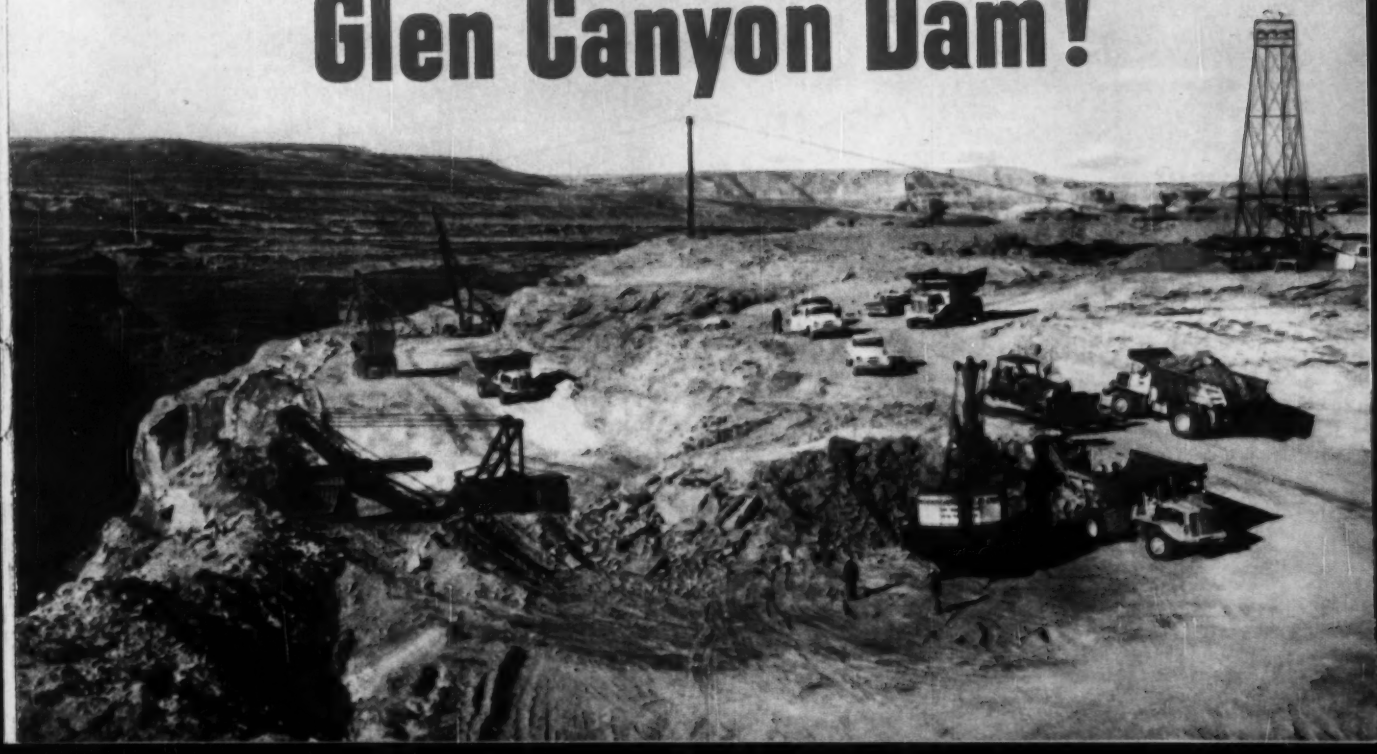
Merritt-Chapman & Scott mobilizes International® fleet to build colossal Glen Canyon Dam!



Noon time is inspection time as Merritt maintenance men, using International welder and shop trucks, roll up to Marion power shovel for fast, on-the-job service.

$108 million contract crawlers, haulers,

"95" Payhauler fleets keep busy on both sides of the 700-foot-deep canyon. These three units are hauling shovel-loaded rock from spillway excavation on the huge Glen Canyon Dam project.

Carving off a section of Beehive Rock to enlarge a working area—TD-24 Planet Power steering keeps the blade full, rounding the curve; moves bonus yardage, every pass. Payhaulers on road below are moving sandstone to a fill.

rolls on schedule with International® trucks and service!

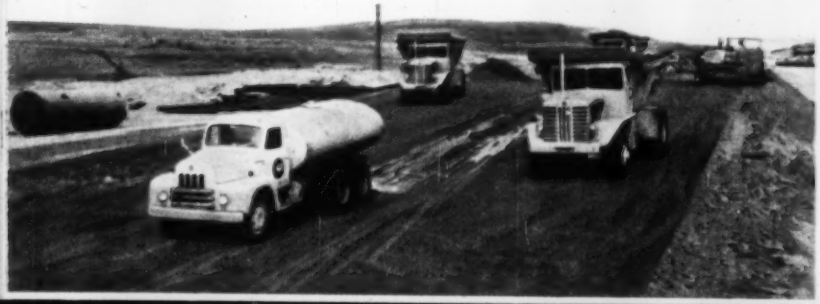
8-passenger International Travelall, with hill-climbing four-wheel-drive, transports engineers and surveying equipment over rough terrain right to the dam site.

Here a rugged International truck with boom rig is used by electrical linemen to set up important transmission lines on the east side of the Colorado River.

On-the-spot maintenance. International shop truck moves in as shovel takes "fuel break" from International cab-forward tanker.

Big capacity. Six-wheel heavy-duty International truck with 5,000-gallon tank sprinkles water for compaction of road base.

Ready for any emergency. Merritt medical crews use International Travelall ambulances, complete with oxygen and first aid equipment, to provide mobile first aid. One stands by on each side of the river.

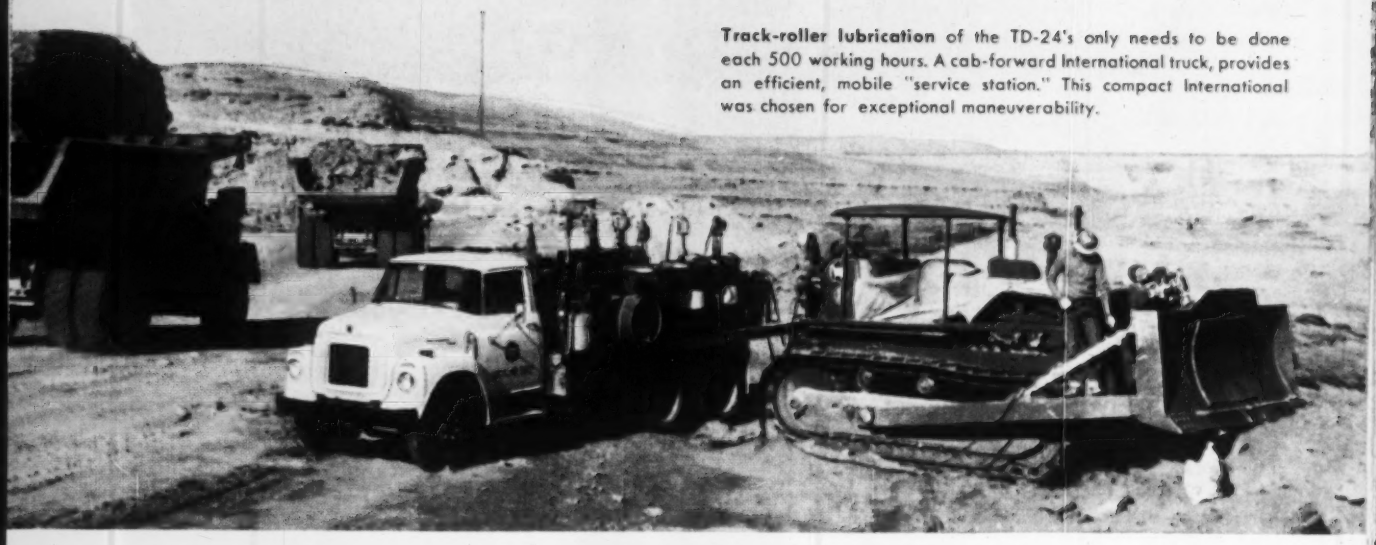


MERRITT-CHAPMAN & SCOTT CORPORATION is shooting to complete its $108,000,000 Glen Canyon Dam contract—biggest competitively bid job ever awarded to a single contractor—well ahead of the specified seven-year limit. A big fleet of International equipment helps keep this huge Bureau of Reclamation project on the Colorado River in Northern Arizona rolling at record pace.

Planet Power-steered TD-24 crawlers prove the worth of full-time live power on both tracks—blading bonus loads 'round the curves. Grade-beating "95's" high-balling rock show why a load-and-road-matched Payhauler® fleet—bonus-powered with turbo-charged diesel engines—belong on this tough, high-altitude job. International trucks are here, there, and everywhere—handling a multitude of different material, equipment, and personnel-carrying assignments.

And complete International parts and service is minutes close to insure high performance availability of every International machine.

Making ready for power. Conventional International truck with engine-driven auger sinks holes for transmission lines.



Track-roller lubrication of the TD-24's only needs to be done each 500 working hours. A cab-forward International truck, provides an efficient, mobile "service station." This compact International was chosen for exceptional maneuverability.

Prompt, performance-backing International service ... company and distributor... *keeps 'em rolling!*

The complete service resources for which International is world-famous are on the job for Merritt-Chapman & Scott—to help keep all International equipment rolling and producing!

It makes no difference that the job is remotely-located and 125 miles from the nearest rail-head. International, the distributor, and the dealer concerned have augmented existing parts stocks and facilities—have set up supply channels that assure on-the-spot parts availability.

Specialized distributor and company servicemen are so promptly available it's as convenient as a "down-the-street" service department.

YOU CAN HAVE THIS SAME big-capacity, specialized International performance—wherever you operate and on whatever scale—and with top performance-backing company, distributor and dealer service. See your International dealer or distributor for a demonstration of the construction equipment and motor trucks you need for high-balling your next job!

International Harvester

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Motor Trucks . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines.

the possibility of heavy earthquake forces.

The project was built by the Venezuelan Ministry of Agriculture & Husbandry. Arthur Froehlich was the architect, Henry Layne the consulting engineer, and T. Y. Lin & Associates consultants on the design and construction of the roof shells. Edward K. Rice, Felix Kulka and Howard R. May of the Lin firm designed and supervised construction of the shells.

Brazilian Hydro Projects To Get World Bank Loans

The World Bank has returned to do business in Brazil, reactivating a canceled $25 million loan for hydroelectric power projects and implementing new loans for other public or private works.

Usinas Eletricas do Paranapanema S. A. will get $13.4 million credit for its 130,000 kw hydroelectric power plant project at Jurumirim, Sao Paulo. Total cost of the job is estimated at $30 million.

The remaining $71.6 million probably will go to the Sao Paulo Light and Power Co., for expansion of its Piratininga thermal electric plant. Piratininga will up its present capacity by 250,000 kw. The SPLPC also is negotiating with the Export Import Bank for loans to bolster its two big power networks in Sao Paulo and the Federal District of Rio.

Sao Paulo State is Brazil's biggest consumer of electricity because it contains nearly 85% of Brazil's industrial production capacity and more than 45% of the agricultural production.

Israel Plans Worldwide Engineering Conference

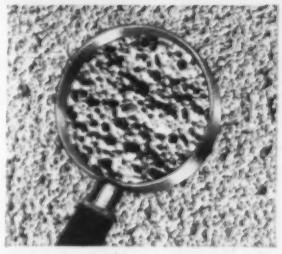
The World Assembly of Engineers and Architects, Friends of Israel, will be held from May 29 to June 9 in conjunction with Israel's 10th anniversary celebration.

Engineers and architects from all parts of the world are invited to attend the sessions whose central theme is the "role of technology in the development of Israel."

Sessions will be held in Haifa, Tel Aviv and Jerusalem. Among the engineers speakers will be Philip Sporn, president of American Gas & Electric Co. and Louis Kahn, professor of architecture at Yale University.

U. S. engineers and architects interested in attending the Assembly may obtain additional information from the American Society for Technion-Israel Institute of Technology, 100 Fifth Ave., New York City.

Send NOW for full case study . . .



At Danly Machine Specialties, Inc., Cicero, Ill., insulation problems posed by roof-top parking were solved by Borg-Warner's new BETOCEL Cellular Insulating Concrete (inset). Unique cellular structure affords maximum insulating value and strength . . . with minimum weight and cost.

New light-weight insulating concrete solves 2 problems . . . cuts costs 48%

Problem: Designed for roof-top parking, the building you see above presented an unusual problem in roof insulation. Since the building was to be air conditioned, high insulating value was a "must." But so, too, was strength . . . for the insulation would have to withstand the weight of almost 400 tons of automobiles!

Solution: After a careful study, the material chosen was BETOCEL Cellular Insulating Concrete, Borg-Warner's new light-weight fill for roofs and floors!

Results: Not only were the twin requirements of strength and efficiency met and surpassed, but BETOCEL did the job at 48% lower cost than the competitive materials considered. Overall net savings on the 90,000 sq. ft. job: more than $23,000!

Results like this are typical of the kind of savings you may well realize with BETOCEL Insulating Concrete! Get full details now by returning the coupon below.

Quickly, easily installed, BETOCEL is the ideal insulating fill for wet-poured roofs and floors. No other light-weight concrete gives you all these wanted features:

- *Controlled density*
- *High thermal value*
- *High compressive strength*
- *Fire, moisture resistance*
- *Unmatched economy*

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Some choice territories still available. Inquire today.

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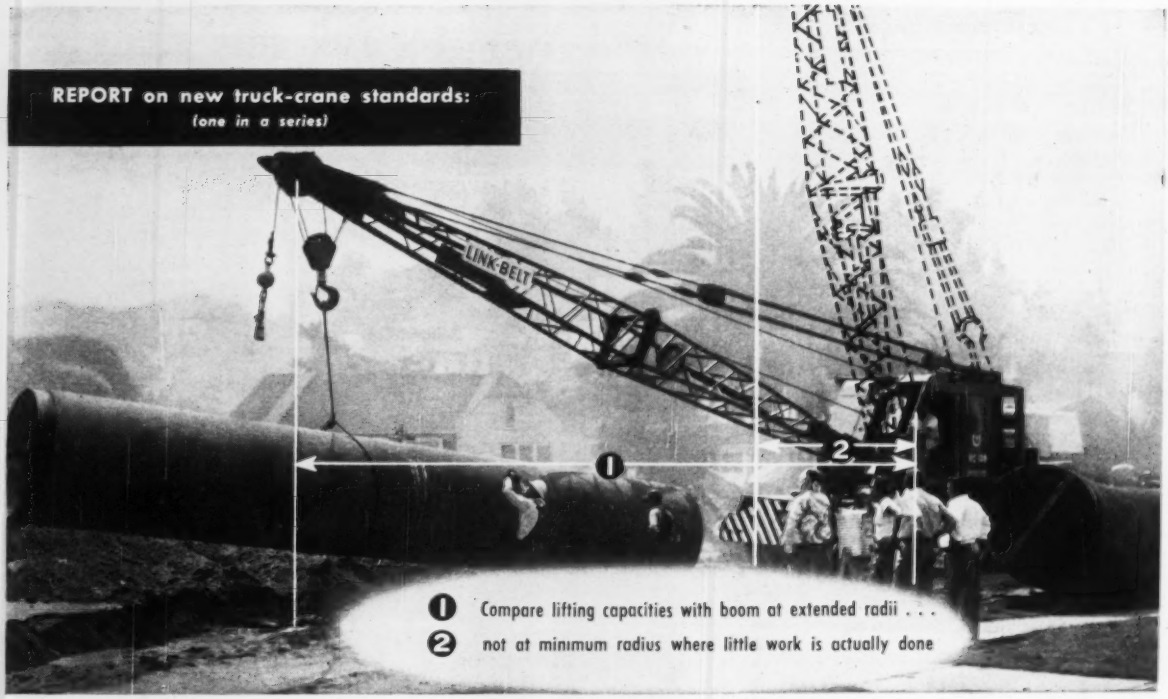
Dept. ENR-1, Chicago 4, Ill.

Please send me:
☐ case study above
☐ complete A.I.A. File
☐ BETOCEL sample
☐ distributorship details

Name_____
Company_____
Address_____
City_____ State_____

8292


REPORT on new truck-crane standards:
(one in a series)
LINK-BELT
1
2
1 Compare lifting capacities with boom at extended radii . . .
2 not at minimum radius where little work is actually done

TRUCK-CRANE PRODUCTION: Most truck-crane jobs require using long booms at extended radii. Under these circumstances, Link-Belt Speeder machines are unsurpassed. Why? Because of high strength-alloy booms and new high-capacity jibs, extra "live" weight, strategically located uppers for better balance and stability plus advanced-design features such as clutch *up* and *down* on boomhoist.

Extending truck-crane utility

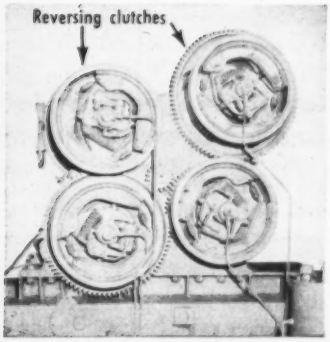
With new increased lifting capacity at extended radii plus outstanding mobility, Link-Belt Speeder Zephyr-cranes handle many jobs formerly handled by crawlers

Truck-crane production is directly related to lifting capacity. But lifting capacity varies with boom length and radius.

Thus, it's important to measure capacity on the basis of a boom out 25 feet and beyond where the bulk of the work is done. You'll be amazed to find that a Link-Belt Speeder far outperforms other similarly rated machines.

It's one of many ways a Link-Belt Speeder helps set new, more profitable standards of truck-crane operation. Contact your Link-Belt Speeder distributor or write for details. LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

FAST, POSITIVE, SAFE CONTROL—True power hydraulic controls are a Link-Belt Speeder exclusive . . . utilize oil under pressure to do the work. The operator merely flips short-throw levers. Smooth - operating hydraulic - actuated clutches provide perfect feel of the load at all times.



LOAD LOWERING CLUTCHES—Hydraulic-actuated reversing clutches are available for either or both main drums. They provide power load lowering of main hoist line and jib whip line. All clutches are interchangeable within a given machine . . . are self-adjusting for heat and normal lining wear.

14,530

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

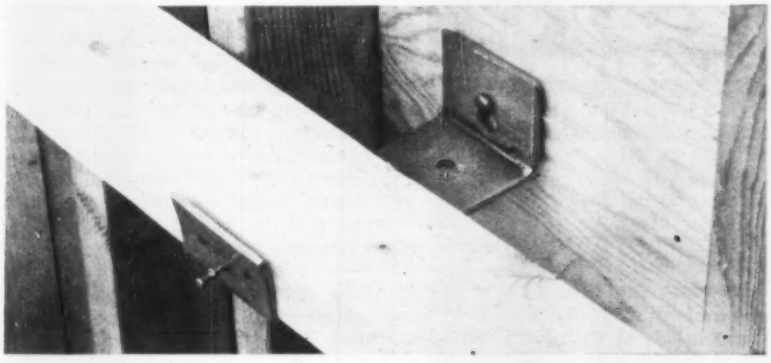
Travel Desk Makes Auto Into Office

A new "vehicular desk" made of lightweight anodized aluminum is equipped with a light and with a container for papers.

The unit is an 8 in. x 12 in. desk or writing platform, backed by a 1-in.-deep basket enclosed on three sides. The fourth side of the basket has a retaining spring to prevent loss of completed paper work. Removal of a ball point pen from a holder releases a spring and the papers then are easily accessible.

A mounting bracket for the unit is secured to the bottom of a dashboard flange by a self-threading screw, and may be adjusted sideways, backward and forward. The desk portion is easily detachable so the operator may carry the desk and paper to point of delivery or use.

Optional equipment includes a light that plugs into the car's electrical system. Product Development Corp., P. O. Box 38, Mt. Ephraim, N. J.



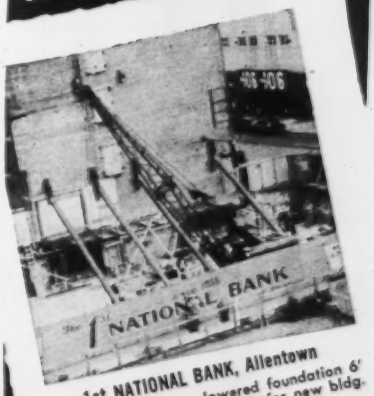
Fastener Speeds Plywood Forming

Use of a new fastening device permits building plywood forms 20 to 40% faster—according to contractors' estimates—than conventional concrete forming systems.

The device, called a Ply-Tie holder, is a bracket designed for conventional fir plywood panels. One arm of the bracket has a tear-drop slot that fits over the head of a special form tie. The other bracket arm holds the wale.

Tie holes are predrilled in the ply-

From our 50th Anniversary Album



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Shored up old bldg., lowered foundation 6' while doing foundation work for new bldg.

Service Experience
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155 E. 44th St., New York 17, N. Y.
General Contractors for 50 Years
Inquiries are invited—no obligation.

Kinnear Rolling Doors

Kinnear Steel Rolling Doors are **Registered.** Full details on every door are held in fireproof vaults. Kinnear Doors *never* become "orphans". Worn or damaged parts are replaced even after **50 years of door service.**

KINNEAR ROLLING DOORS
Saving Ways in Doorways

Write for catalog!
The KINNEAR Manufacturing Co.
1820-40 Fields Ave., Columbus 16, Ohio
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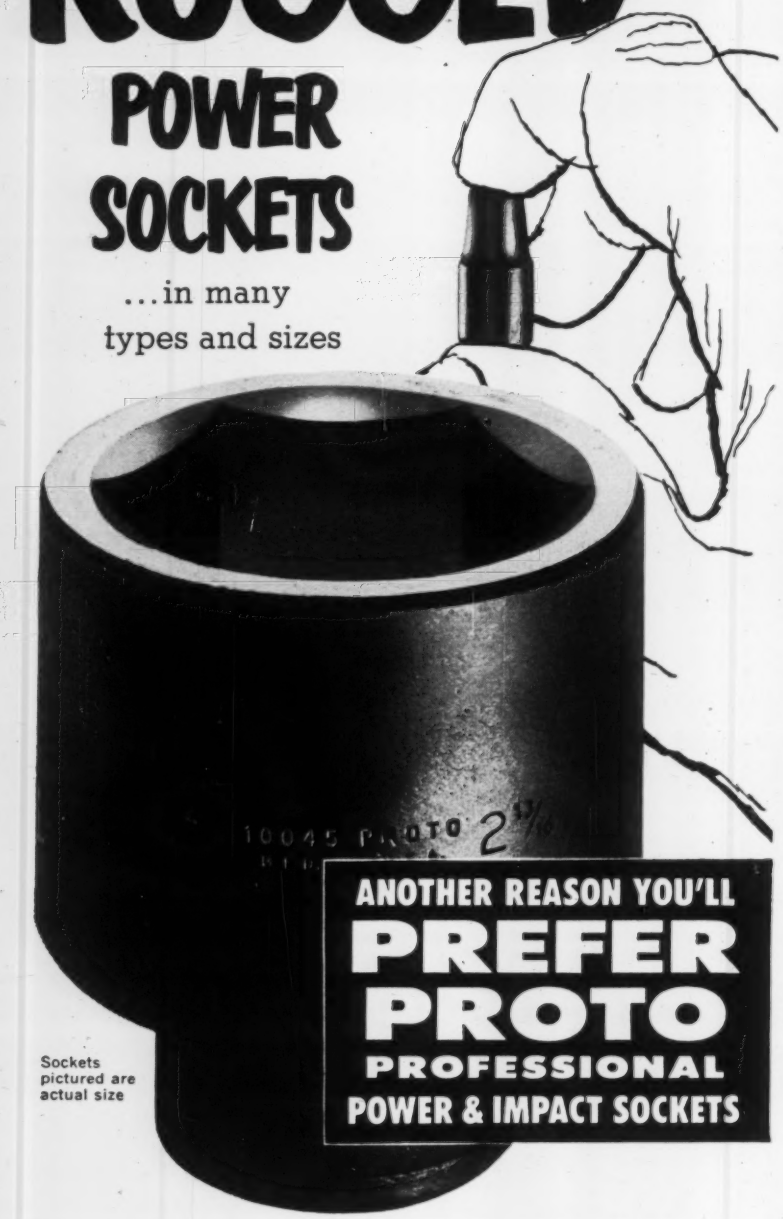
RUGGED POWER SOCKETS

...in many types and sizes



ANOTHER REASON YOU'LL PREFER PROTO PROFESSIONAL POWER & IMPACT SOCKETS

Sockets pictured are actual size

Protoloy alloy steels, scientific heat treatment and advanced design give Proto sockets extra strength ... plus ... high safety factor, long life, low cost. Send 10¢ for 84-page tool catalog. Proto, 2209 Santa Fe Ave., Los Angeles 54, Calif.

MANY TYPES AND SIZES
Standard sizes
from 3/16" opening in 1/4" drive
—to 3 1/8" opening in 1" drive.
Special sizes
up to 9 1/4" opening in 2 1/2" drive.

PROTO TOOLS
PROTO means PROfessional TOols
DIVISION OF PENDLETON TOOL INDUSTRIES INC.

wood to a pattern. Then, 2x4 studs are tacked to the plywood. The Ply-Tie holder secures the form tie and holds the wale in place.

Because the wale drops into a number of holders, a minimum of nailing is required. And stripping is simply a process of springing the wales loose and releasing the tie holder with the tap of a hammer. The same holder can be used for light, medium or heavy construction by varying the spacing and thickness of studs and walers. TRUE-FORMS, INC., 414 TIMES SQUARE BLDG., SEATTLE 1, WASH.

New Aids For Draftsmen

More new equipment to increase drafting room efficiency is available.

A drafting pencil, the "Mars Technico" pushbutton lead holder, has a knurled finger-grip that prevents pencil slipping in the hand. J. S. Staedtler, Inc. Available at drafting supply dealers.

A capillary-controlled drafting pen permits use of ordinary ink on any drawing surface and will draw a line of more than 1,000 ft length without refilling. OZALID DIV., GENERAL ANILINE AND FILM CORP., JOHNSON CITY, N. Y.

An architectural scale made of clear acrylic displays all eight scales on a single side. Each scale has its own straight edge and is calibrated to professional standards. A. LAWRENCE KARP, 16 PUTNAM PARK, GREENWICH, CONN.

Trenching Machine Offers Compactness and Flexibility

Compactness in design along with features found on larger machines is one of the main advantages listed by the manufacturers for the Parsons 77 ladder-type "Trenchliner".

Measurements on the trencher include a 5 ft 10 in. roading and 5 ft 5 in. digging height, 4 ft width and a total transportation weight of 6,750 lbs.

Digging range is to 5 ft depths at 6 to 18 in. widths. Digging feeds of from 4.4 to 181 in. per minute are available. Bucket line speeds range from 38.5 to 24 ft per minute. Forward speeds from 375 to 2.41 miles per hour are provided.

Low traction transmission furnishes maximum production regardless of soil conditions, according to the manufacturer's engineers. PARSONS CO., (DIVISION OF KOEHRING CO.), NEWTON, IOWA.

(New Products cont'd. p. 76)

Typical of Wilson Paving's work is this rural road resurfacing job in Dickens Township, Pennsylvania. Secondary road improvement like this will receive a bigger and bigger share of appropriations as the Road Program progresses.

4,000 tons of cold mix through Blaw-Knox PF-45 without downtime!

Wilson Paving goes from pull-box to Blaw-Knox Black Top Paver as a business investment

Until recently Wilson Paving of Carlisle, Pennsylvania, placed asphalt with a drag or screed type box. According to J. Frank Wilson, president, their typical job was small, usually in the several hundred square yard class. To get into a position to bid on some of the larger street and secondary road jobs, Mr. Wilson purchased a Blaw-Knox PF-45. He was convinced that the rubber-tired operation of the machine and other features more than met the specs.

Working with a CL2 premix of his own manufacture, Wilson also required a machine that would handle the cold mix, which was generally quite tough to lay. He wanted to cut handwork, have an easily operated and maneuverable machine for the tight places typical of smaller jobs. The machine had to be easily transported and virtually maintenance-free. Wilson discovered the PF-45 had all of these features.

His experience in placing more than 4,000 tons of bituminous material proved three outstanding advantages of the Blaw-Knox PF-45. High production, economical production, and quality production. Wilson says "I would certainly recommend it to anyone for this type of work."

Why not find out how the PF-45 will help your business grow? Your Blaw-Knox Distributor has all the details. See him soon.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division
41 Charleston Avenue, Mattoon, Illinois

No other roof deck material gives you
so much insulation...with so much
strength...at so little weight!
Permalite Insulating Concrete

The figures tell the story

INSULATION 1:6 mix portland cement and Permalite expanded perlite aggregate has a "k" of 0.58..."U" value of .219 for a 2" thickness with built-up roof.

STRENGTH 1:6 mix has compressive strength of 180 psi – nearly 13 tons/sq. ft. For greater strength, a 1:4 mix provides 440 psi – more than 31 tons/sq. ft.

WEIGHT 1:6 mix has dry density of 27 lb./cu. ft. A 2" thick slab weighs only 4½ lb./ sq. ft.

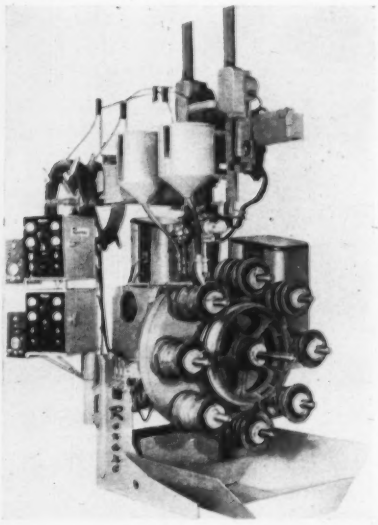
Fire safe. Handled and placed like any ordinary concrete. Easily sloped to drain. Can't rot... vermin proof... termite-proof. For the complete story, see your Sweets File, or write

Permalite® THE LARGEST SELLING PERLITE AGGREGATE IN THE WORLD

Perlite Department, Great Lakes Carbon Corp., 612 S. Flower St., Los Angeles 17, Calif.

Permalite aggregate is produced by licensed franchisees from perlite ore mined by Great Lakes Carbon Corporation.

. . . New Products



Hard-Facing and Welding Machine Repairs Idlers

A twin-head automatic roller and idler welder and positioner that can mount eight tractor rollers and one idler at a time is now on the market.

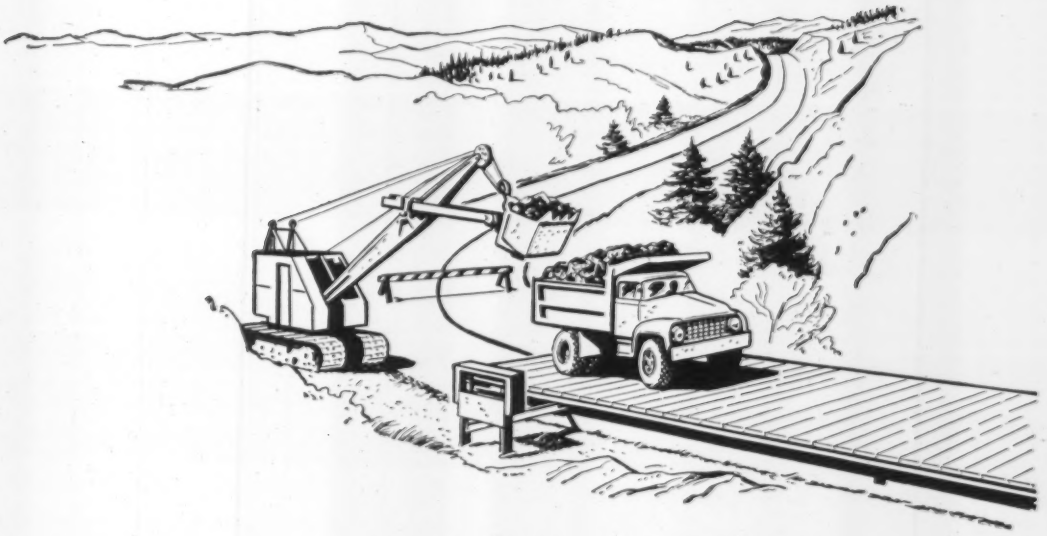
This new rolling machine, known as the Rex Arc NS-8, builds up both sides of the worn tractor rollers simultaneously and automatically. The twin rolling heads are power-operated both vertically and horizontally and operate at the same time or independently, as needed.

The equipment was exhibited and demonstrated at the American Welding Society Show, St. Louis, last week. SIGHT FEED GENERATOR CO., WEST ALEXANDRIA, OHIO.

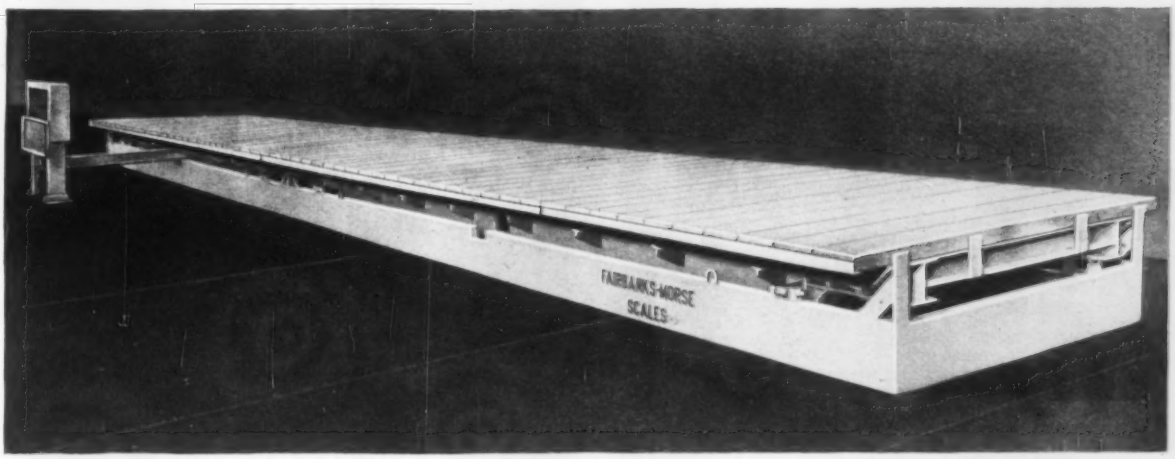
New Features Provided By Steel Strip Siding

A new galvanized corrugated 28 ga steel strip is being marketed by Ceco Steel Products under the name Cecoroll. Available in 31 ft rolls, either 30 or 15 in. wide, the strip has a crimped 1½ in. lap flange on each side, one of which is lined with a mastic to provide a seal in final installation. This combination provides weatherproofing, added strength and tight railing to girts, according to the manufacturer.

The sealing compound is applied when the material is crimped by the manufacturer and is protected by paper guards until installed. As nails are driven through the crimped flange, the mastic spreads out, sealing the sheet lap. The sealer will not run or dry out in hot weather or crack in extreme cold, the manufacturers says. CECO STEEL PRODUCTS, 5601 W. 26 ST., CHICAGO, ILL.



Weigh it at the job site



Here's a portable truck scale, completely self-contained, that can be transported by truck! Ideally designed to follow strip mining operations, the new Fairbanks-Morse Portable Vehicle Scale is a completely self-contained unit made to travel on a flat bed truck. No scale pit is needed!

Just take off the wooden platform panels, disconnect the transverse lever and tighten the hold-down bolts—and you have a package eight feet wide, legal to ride the highways.

Units can be used singly or connected in tandem to the same registering beam or dial. Standard models are available in eight lengths to 60 feet and in capacities of 30, 40 and 50 tons.

Analyze your present weighing practices. On-site weighing will probably save you time and money. Write today for the Fairbanks-Morse New Portable Vehicle Scale Bulletin No. ASM520.1. Fairbanks, Morse & Co., Dept. ENR-4-24, 600 South Michigan Avenue, Chicago 5, Ill.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

Heltzel Flex-Plane

UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batcher and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

2202

THE HELTZEL STEEL FORM AND IRON

FLEX-PLANE COMBINATION FINISHER-FLOAT does two jobs in one, reducing crew time to an absolute minimum. The combining of these two jobs is a natural—results in a better finish in faster time. This new machine was thoroughly tested on several jobs last season. Contractors report 4000 feet of 24-foot pavement was floated and finished in a normal day with but two or three hand finishers required. Get the facts on this profit maker before submitting too many quotations.

Engineering

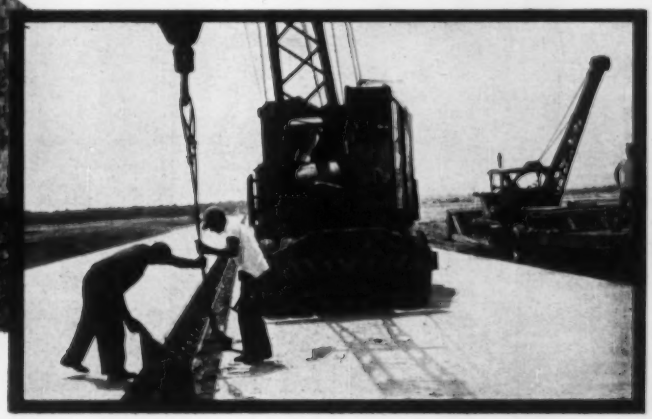
brings you unitized batching, improved forms and a new way to finish concrete

Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast*.

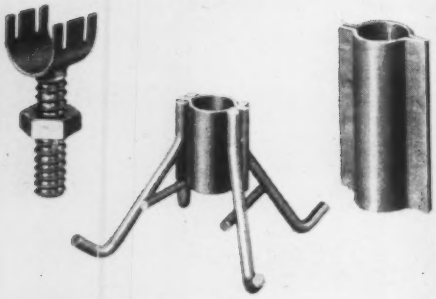
That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

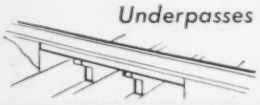
HELTZEL DUAL DUTY FORMS, such as those shown in use on the Plattsburg SAC base, have been redesigned to assure fast setting and stripping with maximum strength-weight ratio. Sizes available to exactly suit your job requirements.



COMPANY • Warren, Ohio

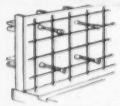


HEAVY-DUTY SCREED SUPPORTS



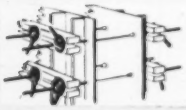
Overpasses and Underpasses

THREADED COIL TIES



Engineering Structures

TILT LOCK CLAMPS



Heavy-Duty Forming

4-STRUT COIL ROD ANCHORS

Temporary or Permanent Anchorage

SUPERIOR

One Source For All Accessories For Dependable Concrete Forming

These are examples of the numerous types of form ties, anchors, inserts, and other items in Superior's most complete line of concrete accessories. The illustrations show the variety of concrete form work and related jobs in which Superior accessories are used. All items are designed to provide the most dependable and efficient forming methods.

WHENEVER YOU ARE PLANNING FORM WORK... Superior's technical assistance is available to prepare suggested layouts. Call or write to nearest address shown below.

SUPERIOR CONCRETE ACCESSORIES, INC.

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1775 Broadway
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Pacific Coast Plant
2100 Williams St.
San Leandro, Calif.

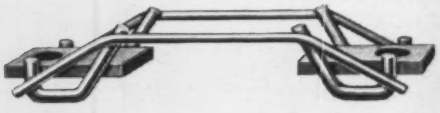
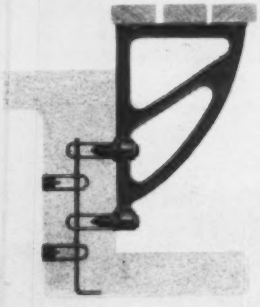


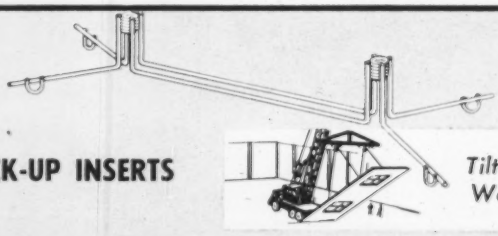
PLATE HANGER FRAMES

Bridge Superstructures



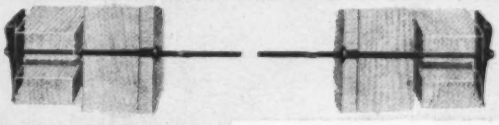
RISER-FRAMES

Stadiums and Grandstands



PICK-UP INSERTS

Tilt-Up Work



SNAP TIES

Ordinary Foundations

Men and Jobs

Concrete Contractors Elect New Officers

At its first annual convention in Chicago February 24-26, the National Concrete Contractors Association elected Bert Carey, president of Bert Carey & Co., Forest Park, Ill., to serve as its president for 1958.

Other new officers include Vice Presidents Fred A. Finomore, Cleveland, E. Ray Freeman, Dallas, and Phillip J. Hoerr, Peoria, Ill. Henry Myers, Chicago, was elected secretary; Carl P. Norducci, treasurer, and James D. St. Clair, executive director.

Headquarters of the new association, which was organized last July, are located at 139 N. Clark, Chicago. Membership in the association now totals 270 representatives of contracting and allied firms in the portland cement concrete industry.

Careers

Public Works

Robert H. Harmeson has been appointed head of the Peoria Research Laboratory of the Illinois State Water Survey.

Paul A. Rechard has accepted a job as senior engineer for the Upper Colorado River Commission, Salt Lake City.

Harry O. Weber has retired from the Tennessee Valley Authority as chief of the Civil Engineering Branch of the Division of Power Engineering and Construction.

Joseph Nardone has been named director of the Federal Housing Administration's insuring office in New York City. He succeeds **William A. Schultz,** who resigned.

Gordon R. Exley, II, industrial management, design and construction consultant, has been named executive director of the Bucks County Development Committee and Bucks County Industrial Development Corp. in Pennsylvania. He replaces **Franklin C. Wood** as director of the Development Committee. Mr. Wood has resumed his position as executive director of the Bucks County Planning Commission.

Business

Donald H. Park, research engineer with the interstate division of the Montana State Highway department, resigned Feb. 14 to join Western Engineers, Inc., Salt Lake City, Utah. He had been with the highway department for 13 years.

Joseph V. Swift has been named man-

"Cross-Sectional configurations have been found to have an influence on watertightness" *

TESTS PROVE CROSS-SECTION DESIGN OF DURAJOINT WATERSTOP TO BE FAR SUPERIOR!

A series of tests have been conducted by the Ontario Research Foundation in order to determine how the functional performance of DURAJOINT Waterstops, 4" and 6" wide, will compare to the functional performance of Dumbell Type Waterstops, 6" and 9" wide, when embedded in concrete and subjected to hydrostatic pressures of various magnitudes.

These tests provided many interesting and important results . . . it takes the right combination of PVC material and multiple-ridge cross-section design, found only in DURAJOINT, to stop water under all joint conditions that are likely to exist . . . the 4" wide DURAJOINT Waterstop is far more effective than the 6" wide Dumbell Type Waterstop and the 6" wide DURAJOINT Waterstop is also far more effective than the 9" Dumbell Type Waterstop.

DURAJOINT and DURASEAL Waterstops are strong, flexible, lightweight, easy to install . . . all types of joints, such as tee, box, cross-joints, overlapped and butt splices may be quickly and easily made on-the-job without the use of special equipment or skilled labor.

Be sure to investigate these interesting results yourself . . . just mail the coupon (below) today, for your free copy of Technical Report No. 4 that contains complete technical data, as to how the performances of waterstops compare, plus actual copies of the test reports. If you are interested in watertight waterstops, this report should prove to be one of the most interesting technical manuals you've ever read.

* Journal of American Concrete Institute, Discussion 52-7, V. 28, No. 6, Dec. 1956, Part II, Proceedings V. 52, Page 1151

DURAJOINT TECHNICAL INFORMATION *Center*

121 HILL AVENUE • AURORA, ILLINOIS

Gentlemen: Dept. 16

☐ Please send, without obligation, my free copy of Technical Report No. 4.

☐ DURAJOINT Catalog No. 457.

☐ Have representative call.

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Weldynamics

ARC WELDING AT WORK CUTTING COSTS

Portable power plant saves time and money for builders

How often have you needed electric power on a job before commercial lines were available? Weldynamics bring you low cost, easy-to-use power in the form of Weldanpower.

Weldanpower generates 5KVA of 230 and 115 volt power and 200 amps welding current with one machine. It's the answer to the contractor's power problems. Lightweight, compact, easily trucked from one job to another, Weldanpower packs a lot of punch!

Weldanpower furnishes 5KVA 115/230 volt AC, 60 cycle power and 200 amps AC welding current.

IT'S A WELDER TOO!

As a 200 ampere welder, Weldanpower is always ready to make on-the-spot repairs or work on construction—and you can run lights and equipment while welding.

Get the facts on how you can cut costs with Weldanpower. Write for Bulletin SB-1339.

The World's Largest Manufacturer of Arc Welding Equipment

LINCOLN

THE LINCOLN ELECTRIC COMPANY • DEPT. 3439 • CLEVELAND 17, OHIO

ager of the new Kansas City, Mo., office of Dorr-Oliver, Inc. A civil engineer, he has been handling Sanitary Sales for D-O's southeastern division in Atlanta. Sales Engineer **Lee Roy H. Walter** also has been assigned to the Kansas City office, prior to joining D-O, he served as sanitary engineer with the Kansas State Board of Health, Division of Sanitation, and as senior civil engineer with the Kansas City Water Department.

Several changes are to be made in the central engineering department of Atlas Powder Co., Wilmington. Chief Engineer **J. Charles Allen** will become consultant to the senior vice president. **Wilbur H. Kordt** will become director of the central engineering department. The department's construction services section and the design section have been consolidated under **Frank Irwin.**

Walter R. Gerich has been appointed chief engineer of Maryland Shipping and Drydock Co., Baltimore, succeeding upon the retirement of **Charles F. Willis.**

C. H. Sandberg, assistant bridge engineer since 1943, has been promoted to bridge engineer of the Santa Fe Railway System. He joined the Santa Fe in 1926, following graduation from the University of Minnesota with a civil engineering degree.

Herman B. Block has been promoted to executive vice president of Merritt-Chapman & Scott Corp., responsible for procurement, trade relations and insurance. He succeeds **Rolland O. Baum,** who recently took the new post of executive vice president and general manager of Tennessee Products & Chemical Corp., a Merritt subsidiary. Mr. Block has been replaced as vice president for procurement by **Louis Goldberg.**

Wilbur Barrows has been named chief hydraulic engineer of Pioneer Service & Engineering Co., Chicago, replacing **Stephen Wehner,** who retired January 1. **D. C. Hormell,** vice president and chief engineer, has been named vice-president and consulting engineer, and is succeeded by **Carl R. Barthelemy** as vice-president-chief engineer. **L. M. Davis** has been elected vice-president and chief structural engineer.

Robert N. Kellogg, retired January 31 as federal projects engineer for Region 8 of the U. S. Bureau of Public Roads, will be a member of a mission to Thailand to reorganize that country's highway department. Mr. Kellogg will represent Charles M. Upham Associates, of Washington, D. C., in Bangkok.

Carl von Linsowe has been named chief engineer of the J. I. Case Co. Crawler Tractor Works in Churubusco, Ind., to succeed **T. A. Haller,** who is

MAINLINE TRAINS STAY ON SCHEDULE DURING BRIDGE RECONSTRUCTION

A typical Commercial tunnel lining support application

The New York, New Haven and Hartford Railroad has to maintain train schedules on a four-track main line while a 70-year old stone bridge on the line is completely reconstructed. Here's how Commercial steel tunnel liner supports help.

The stone arch of the bridge over Stephenson Brook Drain in New Rochelle, New York—55 feet portal to portal—started to give way and fail after years of continuous service involving frequent live loading, vibration and weathering conditions. To prevent complete collapse, and to restore the bridge, all work had to be carried on without interferring with the main-line rail traffic overhead.

First, the 102-inch drain running through the main arch was diverted through one of the eight-foot side arches used as a pedestrian underpass. The main arch was then immediately backfilled and tamped.

Actual restoration of the bridge was begun following approval of design specifications submitted by Commercial engineers. Steel plates and ribs for the arch supports were completely fabricated by Commercial before erection.

As heading in the arch backfill is removed, the steel arch support—four-inch "H" beam ribs, spaced on 16-inch centers, with steel liner plates bolted between each course, are installed into position.

Solid and uniform back packing—between the steel support and the underface of the original stone—is provided by means of high pressure grouting. Easily removable threaded plugs in threaded grout openings facilitate the operation.

When the Commercial steel arch support is finally completed and the earth fill below the spring line is removed, new permanent concrete lining (imbedding the steel ribs and plates) will be poured.

Not once during the complete restoration job will a "slow order" be required for the heavy railroad traffic overhead.

Complete information on how Commercial can help *you* with your surface or sub-surface tunnel problem—regardless of length—is easy to get. Just write to: Dept. E-16, The Commercial Shearing and Stamping Company, Youngstown 1, Ohio.

COMMERCIAL
shearing and stamping

IT'S SERVICE AS USUAL with New Haven trains running on schedule overhead as reconstruction of a stone bridge built in 1887 moves right along to completion.

STEEL TUNNEL SUPPORT braces and holds stone in the sides and crown—will remain in the arch permanently. Lightweight, it requires no erection equipment.

SIMPLE ONE-HAND OPERATION, with ratchet-type wrench, quickly and easily handles all bolting as heading is removed and tunnel liner supports are installed.

WHEN THE JETS COME ROLLING IN...

Steel Pipe Snow Melting will keep Runways and Loading Areas Dry and Clean

Will your airport be ready! The Jets are coming . . . late in 1958 and throughout the years following.

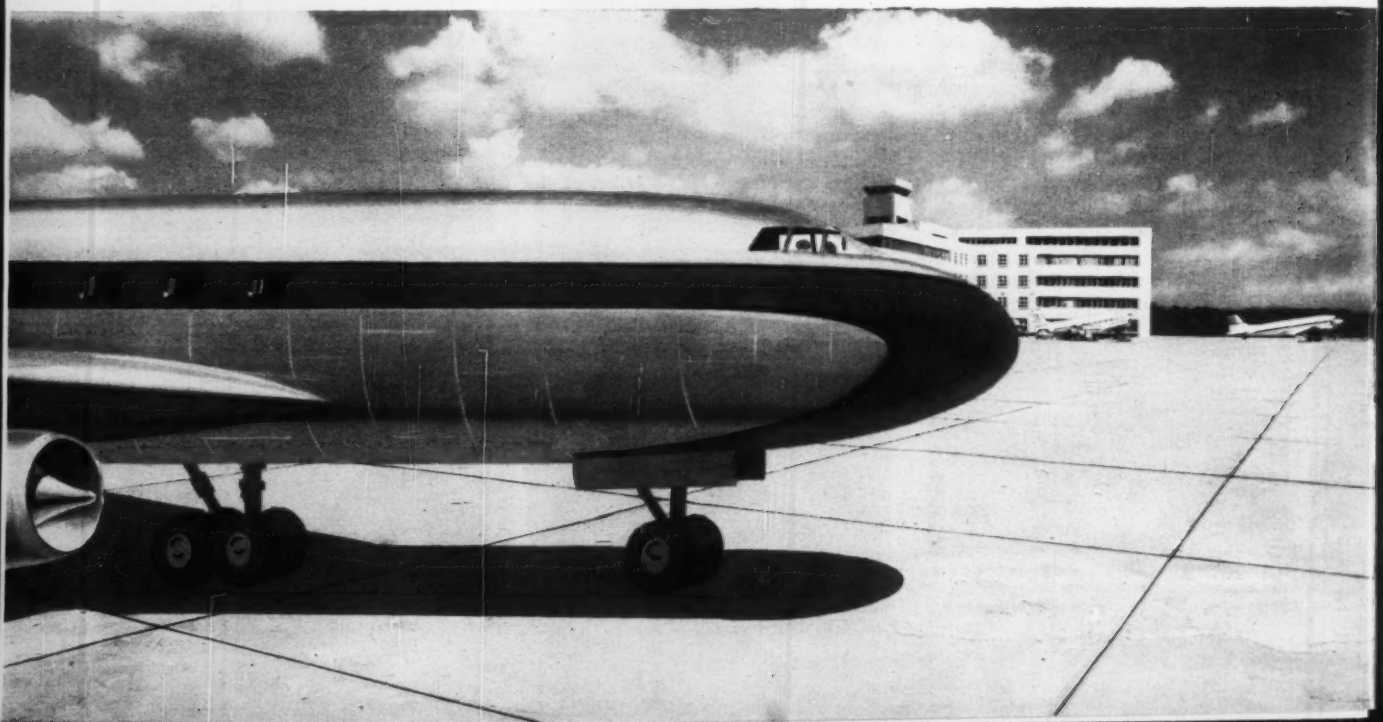
Snow and ice removal by shovels and plows will be as obsolete, and uneconomic, on the ground at a modern airport as the tri-motored "tin goose" of yesteryear would be in the air. Sanding and cindering will be taboo . . . because jet engines are susceptible to damage from debris drawn or blown into the engine intakes.

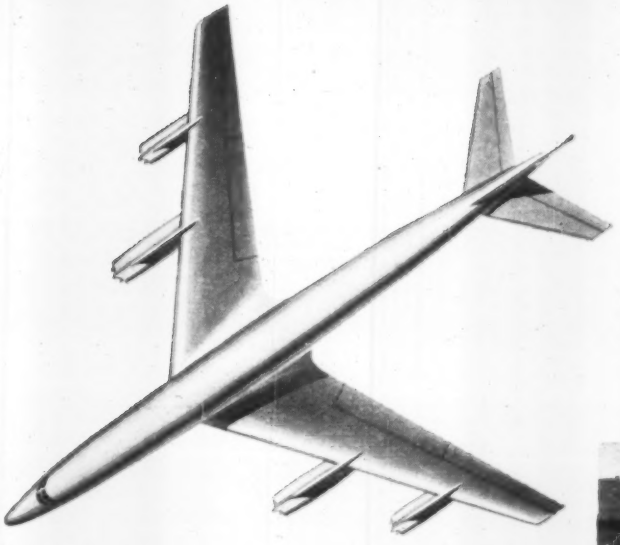
Steel Pipe Snow and Ice Melting systems installed in the runways, loading ramps and hangar aprons of airports now being built or expanded . . . or incorporated in the airport plans on your drawing boards . . . will pay for themselves many times over in the years to come. By attracting jet airplane traffic to your community, eliminating costly snow removal, increasing the safety and cleanliness of your airports.

Investigate now! The technical departments of any of the member companies of the Committee on Steel Pipe Research will gladly cooperate.

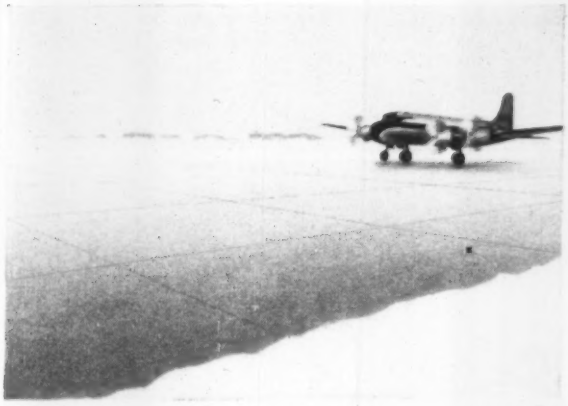
Photo by International

Airports in the snow belt are sometimes closed in for hours or days, awaiting removal of snow from vital runways by snowplows, bull-dozers and even by hand shovelling.





For Highway Snow and Ice Removal, too!



Airports of tomorrow will find the solution to snow removal problems in automatic *steel pipe* snow and ice melting systems which will keep runways open and loading areas clear as in this simulated illustration.

Steel Pipe snow melting grids in process of installation on toll plaza and plaza approaches of Indiana Turnpike.

Proof that Steel Pipe Snow Melting will be effective for airport runways, ramps and aprons may be found in the "prototype" installations of snow melting systems on the Indiana Turnpike, Staten Island Ferry ramps, New York Bus Terminal approaches and countless loading docks, airport hangar aprons, sidewalks and plant approaches. Similar Steel Pipe Radiant Heating systems serve, too, in great new airplane hangars at Trans-Canada's Malton, Ontario Field, O'Hare Field, Chicago, and elsewhere.

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Send for this FREE booklet

A free 48-page booklet, "Steel Pipe Snow Melting and Ice Removal Systems" containing valuable engineering data, is yours for the asking. Write for it today.

Indiana Turnpike Toll Plaza after a heavy snow shows effectiveness of automatic Steel Pipe snow melting.

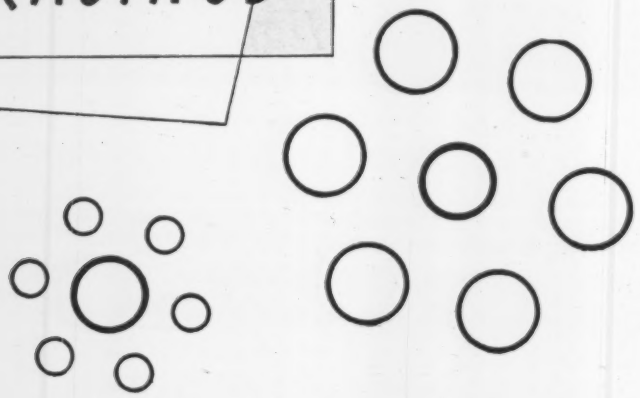
COMMITTEE ON STEEL PIPE RESEARCH

AMERICAN IRON AND STEEL INSTITUTE

150 East Forty-Second Street, New York, 17, N. Y.

TRICKY TRACINGS

Question: Without measuring first, which of the two center circles is larger? See answer below.



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now vice president in charge of engineering at the company's Engineering Research and Development Center, Racine, Wis.

Education

Cornelius Wandmacher, civil engineering department head at the University of Cincinnati, has been promoted to associate dean of the university's College of Engineering, effective September 1. He will be succeeded by **Louis M. Laushey,** now civil engineering department head at Norwich University, Northfield, Vt.

Prof. G. Whitman Reed becomes chairman of the school of engineering, Charkson College of Technology, Potsdam, N. Y.

Otto Zmeskal, who was research professor at the college of engineering at the University of Florida since 1934, has been appointed dean of the college of engineering at the University of Toledo, effective Feb. 1, succeeding Edwin D. Harrison, who resigned last summer to become president of Georgia Tech.

Wayne P. Wallace has been appointed head of the department of civil engineering at Southwestern Louisiana Institute at Lafayette. He was formerly professor of civil engineering at Louisiana State University.

Charles W. Brennan, assistant professor of industrial engineering at Lehigh University, will become assistant to the dean of engineering at Lehigh University July 1.

Ivan C. Crawford, director, Colorado Water Conservation Board, has been appointed by President Eisenhower to the Board of Visitors, U. S. Military Academy, West Point, a group consisting of six presidential appointees, four Congressmen and four Senators charged with overseeing the educational standards of the Academy. Mr. Crawford was dean of engineering at the University of Kansas until 1940, and thereafter, until his retirement in 1951, dean of engineering at the University of Michigan.

Honors

Joseph M. Fink, chief of the Bureau of Structural Engineering, Department of Buildings and Safety Engineering, City of Detroit, received the first annual Huron Award for outstanding contributions toward the promotion of quality concrete. He helped develop and followed through to final adoption the new Detroit Building Code, and has devoted much effort to establishing rules of safety for the use of new materials, designs and methods of construction. The award is sponsored by the Huron Portland Cement Co.

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Semi-automatic hard-facing is fast taking hold in all industry! Here's a process that *removes much of the labor of welding* and is 2 to 4 times *faster* than manual application. Weldors can see the weld —wires are fed bare; no submerging flux or flux dams are required. Welding is continuous, feeding from layer wound coils...no stub ends, no lost time changing electrodes. With higher speed there is lower heat input, less penetration of the base metal and reduced dilution of deposits...hence higher wear resistance than with manual electrodes of similar analysis.

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STOODY SEMI-AUTOMATIC WIRES—Now available in 11 types for *maximum* wear resistance under *every* wear condition!

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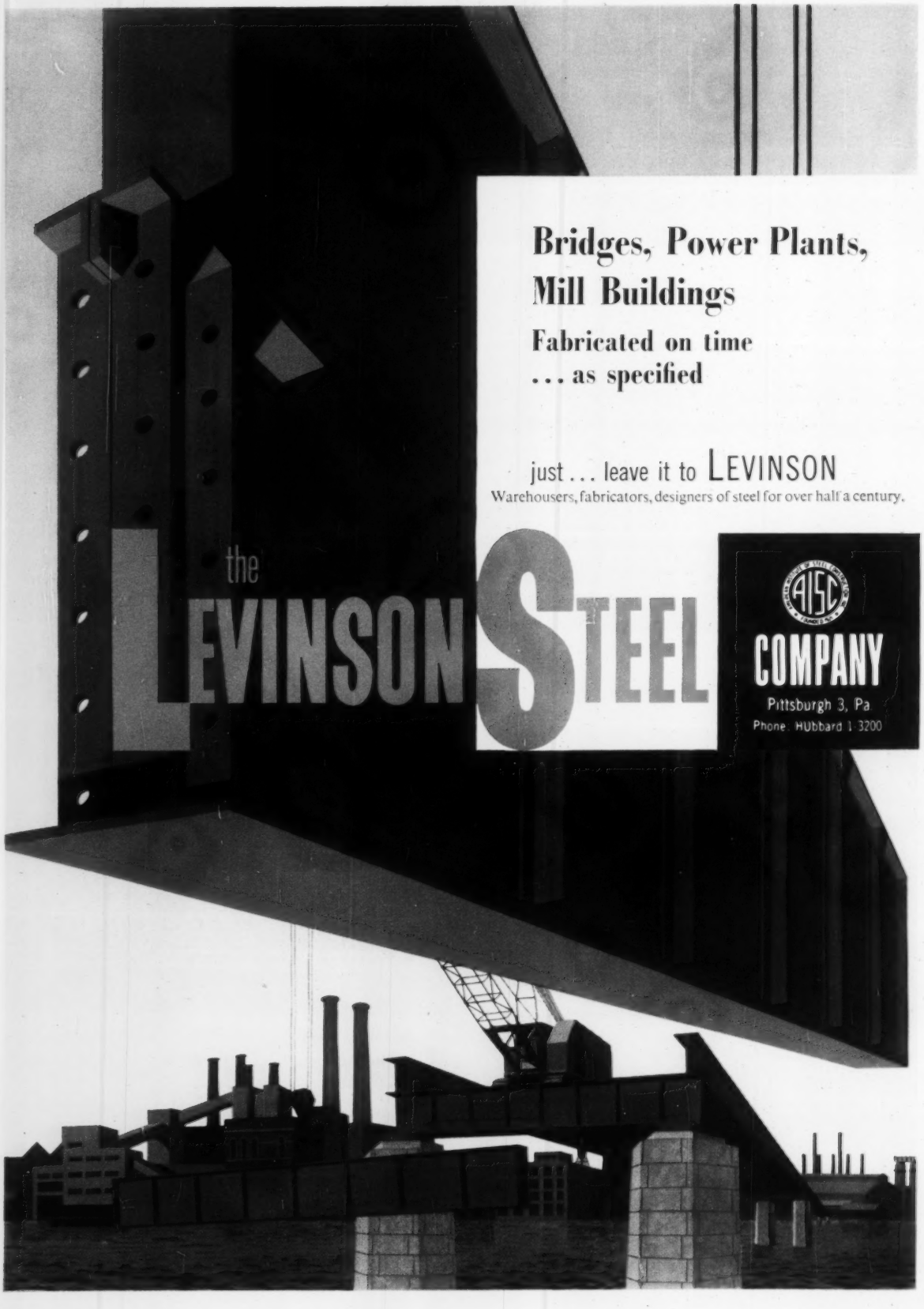
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Mill Buildings
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Dam and Reservoir, Texas

Excavation and borrow accounts for more than a third of $4,301,200 award for municipal water supply

Construction of the Iron Bridge Dam and Reservoir (ENR April 17, p. 33) in Hunt County Court House, Greenville, Texas, for the Sabine River Authority, will require 1,020,000 cu yd of excavation and 5,040,000 cu yd of borrow at 33.5 and 23.5¢ a yd respectively. This is more than one third of the $4,301,200 joint contract to Moorman, DeWitt & Singleton, Fort Worth, and Whittle Contracting Co., Dallas. The project is for the Greenville municipal water supply. Forrest & Cotton, Dallas, are the consultants.

The dam will be 29,300 ft long, with a maximum height of 75 ft. The concrete spillway length, including overflow and non-overflow, is 614 ft, maximum height 64 ft.

The contractor furnishes all materials, but the Authority furnishes an option on the rock source, suitable for riprap or flexible base material. Class A concrete requires four to six bags of cement per cu yd. Cast iron pipe is a 150 centrifugal, ASA 21.6-1953.

Minimum wages in the area include: form builder, structural, $1.60; tractor operator, crawler type, $1.20-$1.40; pneumatic type, $1.00-$1.30; bulldozer operators, $1.40-$1.60; common laborers, $1.00.

1C Moorman, Dewitt & Singleton, Fort Worth, and Whittle Contr Co., Dallas, Texas	$4,301,200
2 Markham & Brown, and Morrison-Knudson Co., Dallas, Texas	4,516,588
13 Edwin E. Morgan, Jackson, Miss	6,448,916
EE Forrest & Cotton, Dallas, Texas	5,451,436

Bids: 12-13-57 Items	Unit	Quantity	Unit Prices 1C	2
Care of water & cofferdam	ls	job	$5,000	$14,000
Clear & grub	ac	170	589.00	500.00
Excavation, stripping	cy	96,000	0.335	0.25
common	cy	816,000	0.335	2.35
shale	cy	108,000	0.335	0.40
borrow	cy	5,040,000	0.235	0.245
Fill, compacted	cy	4,810,000	0.024	0.04
select	cy	700	3.62	4.00
Roll for compaction, add	rh	1,600	0.50	5.00
Dumped riprap	cy	174,000	3.42	3.50
shale fill	cy	113,000	0.02	0.10
Filter blanket	cy	68,000	3.50	3.50
Finger drains	cy	10,000	4.40	5.00
Flexible base course	cy	26,800	3.70	4.00
Conc spwy, weir & non-overflow sect	cy	42,200	18.56	19.00
paving	cy	8,300	18.00	18.00
training & other walls	cy	1,700	24.00	25.00
intake to sluiceway	cy	70	37.00	40.00
approach chan lin	cy	110	37.00	37.00
culvert headwalls	cy	20	65.00	50.00
Cement	bbl	56,250	4.00	4.00
Reinforcing steel	lb	632,000	0.12	0.12
Plastic waterstop	lf	780	5.80	6.00
	lf	380	2.70	3.00
RCCP, 48"ϕ	lf	40	14.00	15.00
42"ϕ	lf	60	12.00	12.00
36"ϕ	lf	120	9.50	9.00
18"ϕ	lf	114	4.50	5.00
Sluice gates, 48"x72"	ls	job	50,000	50,000
Regulating outlets, 20"ϕ	ls	job	32,000	35,000
Orifice gates	ls	job	3,500	3,500
Unseating gate, 36"ϕ	ls	job	3,000	2,500
Water treatment plant	ls	job	10,000	15,000
supply line, 4"ϕ	lf	21,150	1.80	2.00
Valves, air	ea	4	300.00	300.00
gate, 4"ϕ	ea	8	70.00	75.00
Operating house	ls	job	8,500	9,000
Plumbing	ls	job	3,000	3,000
Diesel generating unit	ls	job	9,500	10,000
Metal stairways, circular	ls	job	7,000	8,000
CMP, 24"ϕ	lf	110	6.00	6.00
Handrail, pipe	lb	7,700	0.50	0.50
Guardrail	lf	130	5.00	5.00
Sump pumps	ls	job	1,500	2,000
Gaging facilities	ls	job	1,400	1,500
Misc metalwork	lb	7,300	0.40	0.50
Barricade	ls	job	1,125	1,500
Piezometers	ls	job	5,507	8,000
Highway bridge	ls	job	50,950	50,000
Drill shaft, 30"ϕ add	lf	60	1.00	15.00
& grout anchor bars	lf	6,600	1.25	1.00
4" drain holes	lf	800	0.43	0.50
Staff gage	ls	job	1,500	2,000
Alum tablet & letters	ls	job	380.00	400.00
Electrical work	ls	job	13,000	15,000
Asph, cut back, MC-1	gal	170	0.50	0.40
oil, OA-135	gal	200	0.25	0.30
Road oil, RO special	gal	31,000	0.17	0.20
Mineral agg, tp A, gr 4	cy	10	10.00	10.00
Hauling water 1000	gal	300	10.00	5.00
Sprig & seed	ac	65	350.00	350.00

Commence: Jan. 3, 1958 Complete: 1,100 days
Liquidated damages: $500/day rh—roller hour

Power Plant Extensions, Nebraska, $131 per Hp

Extensions to Wilber, Neb. power plant, including switchboard, panel and diesel gathering unit, will average a cost of $130.75 per horsepower and $1.93 per lb. The $145,131 bid of Worthington Corporation, Omaha, Neb., 3.2% below the engineer's estimate, is on a 1,110 hp motor, which took the contract away from motors ranging from 900 hp through 1,275 hp. Harold Hoskins & Associates, Lincoln, Neb., are the consultants.

The contractor furnishes all materials. The project is at the railroad, and rail and truck transportation will be utilized.

		HP	Motor Cost per hp	Cost per lb	Total cost
1	Fairbanks Morse & Co. Omaha, Neb	950	$115.27	$2.38	$110,661
2	Fairbanks Morse & Co.	1,067	116.62	2.05	124,436
3	White Motor Co., Diesel Engine Div., Springfield, Ohio	900	159.00	2.43	143,103
4C	Worthington Corp., Omaha, Neb	1,110	130.75	1.93	145,131
5	Worthington Corp	1,275	127.11	1.95	162,066
6	Nordberg Mfg. Co., Milwaukee, Wis	1,200	140.76	2.57	168,915
EE	Harold Hoskins & Asso				$145,130

Bids: 3-3-58

Items	1	4C
Cost per HP	$115.27	$130.75
Make of engine	Fairbanks	Worthington
Model	38DD8 1/8	8DRG0-6
Brake horse power	960	1,110
Rpm	720	450
Bmep, psi	84.9	134.6
Piston speed, fpm	1,200	1,312
No. cylinders	6	6
Bore, inches	8 1/8	13 1/4
Stroke, inches	10	17 1/2
2 or 4 cycle	2	4
Make of generator	F-M	pur option
KW rating	675	780
Crankshaft ϕ, inches	8	10 1/2
Flywheel ϕ & weight	as reqd	56" 3786#
Engine weight	46,509#	75,300#
Delivery, days	180	195

Completion schedule: 195 calendar days

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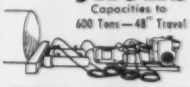

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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last Mar. 27; Next, May 1.
- Wage Rates, Building Board, Lath, Insulation: Last, Mar. 27; Next, May 1.
- Cement Aggregates, Ready-mixed Concrete Asphalt: Last, Apr. 10; Next, May 8.
- Iron & Steel Products, Pine: Last, Apr. 17; Next, May 15.

LUMBER, TIMBER, PLYWOOD—PER M FT., B. M., CARLOAD LOTS F. O. B.

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All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta †	**$73.00**	**$76.00**	**$76.00**	**$79.00**	**$81.00**	**$86.00**	**$136.00**	.....	.....
Baltimore *	**95.00**	**100.00**	**100.00**	**100.00**	**100.00**	**105.00**	**114.00**	.....	.....
	100.00g	*105.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*135.00g*	*$150.00*	*$144.00*
Birmingham †	**80.00**	**82.00**	**75.00**	**82.00**	**85.00**	**90.00**	**105.00**	.....	.....
	70.50	*70.50*	*67.00*	*70.00*	*70.00*	*85.00*	*73.50*	*70.50*	*70.50*
Boston ‡	**90.00f**	**90.00f**	**96.00f**	**96.00f**	**96.00f**	**104.00a**	.....	.....	.....
	92.00k	*92.00k*	*108.00*	*108.00*	*108.00*	*109.00*	*120.00*	*120.00*	*125.00*
Chicago **	**93.00**	**96.00**	**90.00**	**104.00**	**112.00**	**113.00**	**108.00**	.....	.....
	101.00	*101.00*	*114.00*	*112.00*	*112.00*	*115.00*	*121.00*	*121.00*	*121.00*
Cincinnati *	**93.00**	**94.25**	**86.50**	**90.50**	**95.00**	**102.75**	**116.00**	.....	.....
	90.25	*91.25*	*95.50*	*97.50*	*98.25*	*109.00*	*121.00*	*121.00*	*121.00*
Cleveland **	**90.00**	**93.00**	**90.00**	**97.00**	**97.00**	**101.00**	.....	.....	.....
	.....	.....	*100.00*	*96.50*	*96.50*	*98.50*	*115.00*	*115.00*	*115.00*
Dallas k‡	**74.50**	**74.50**	**70.00**	**70.00**	**70.00**	**75.50**	**120.00**	.....	.....
Denver *	*Not in stock*		*80.25*	*122.50*	*122.50*	*127.00*	*136.00*	*148.80*	*163.80*
Detroit ‡	**116.80**	**119.00**	**115.75**	**117.00**	**122.00**	**122.00**	.....	.....	.....
	125.00	*125.00*	*127.75*	*132.50*	*130.00*	*135.00*	*185.00*	*195.00*	*195.00*
Kansas City ‡	**120.00**	**120.00**	**120.00**	**120.00**	**125.00**	**135.00**	.....	.....	.....
	120.00	*120.00*	*120.00*	*120.00*	*125.00*	*125.00*	*150.00*	*225.00*	*225.00*
Los Angeles 1	*90.00*	*90.00*	*90.00*	*90.00*	*90.00*	*90.00*	*115.00*	*120.00*	*120.00*
Minneapolis #	*135.00m*	*135.00m*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*
Montreal ab	**90.00**	**98.00**	**90.00**	**91.00**	**108.00**	**125.00**	.....	.....	.....
	105.00	*105.00*	*165.00*	*165.00*	*165.00*	*165.00*	*170.00*	*170.00*	*170.00*
New Orleans †	**87.00**	**87.00**	**89.50**	**91.00**	**90.00**	**97.00**	**121.50**	.....	.....
	105.00	*105.00*	*94.50*	*115.00*	*115.00*	*115.00*	*127.50*	*127.50*	*147.50*
New York 3	**106.00**	**107.00**	**112.00**	**114.00**	**114.00**	**120.00**	.....	.....	.....
	.....	.....	*117.00*	*118.00*	*118.00*	*119.00*	*162.00*	*162.00*	*162.00*
Philadelphia ‡		Range from 100/120				**105/125**	**105/125**	.....	.....
		Range from 110/140				*115/145*	*125/150*	*158.00*	*158.00*
Pittsburgh 2	**120.00**	**120.00**	**125.00**	**120.00**	**125.00**	**130.00**	**145.00**	.....	.....
	130.00	*130.00*	*140.00*	*140.00*	*140.00*	*140.00*	*165.00*	*168.00*	*168.00*
St. Louis #	**113.00**	**115.00**	**123.00d**	**123.00d**	**123.00e**	**128.00e**	.....	.....	.....
	.....	.....	*131.00*	*131.00e*	*131.00e*	*135.00e*	*189.00eR*	*189.00R*	*189.00R*
San Francisco 1	*69.00*	*69.00*	*76.00*	*76.00*	*76.00*	*76.00*	*90.00*	*109.00*	*109.00*
Seattle †	*87.00*	*65.00*	*65.00*	*65.00*	*65.00*	*65.00*	*75.00*	*85.00*	*85.00*
Toronto a	**92.50**	**93.50**	**90.75**	**90.00**	**90.00**	**90.00**	.....	.....	.....
	115.00	*118.00*	*117.75*	*120.00*	*125.00*	*120.00*	*142.00*	*135.00*	*145.00*

LONG LEAF Y. P. Merchantable grade up to 20 ft.

2x12 Rgh	12x12 Rgh
$121.00	**$156.00**
170.00	**185.00**
.....	.....
115.00	**180.00**
.....	.....
.....	.....
136.00	**136.00**
.....	.....
129.80	**127.80**
.....	.....
.....	.....
138.00	**130.00**
.....	.....
130.00	.....
.....	.....
.....	.....
122.00	**122.00**
.....	.....
181.00	**181.00**
.....	.....
240.00	**250.00**
.....	.....
214/224	**214/224**
.....	.....
140.00	**168.00**
.....	.....
.....	.....
.....	.....
.....	.....

PLYWOOD Rail freight increment (See note for base price)

⅜"	½"
$22.32	$27.24
25.92	31.60
.....	.....
21.78	26.58
.....	.....
25.92	31.60
.....	.....
22.45	27.37
.....	.....
25.00	30.48
.....	.....
25.37	30.93
.....	.....
18.72	22.80
13.92	16.98
25.00	30.48
.....	.....
16.56	20.16
16.61ab	20.25ab
19.89	24.25
.....	.....
.....	.....
18.72	22.80
.....	.....
25.92	31.60
.....	.....
28.00	32.00
.....	.....
25.92	31.60
.....	.....
18.72	22.80
.....	.....
12.22	14.91a
.....	.....
.....	.....
.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment.
‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots.
3. aad., truckload lots, 8/8 Mfrbm.

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 8M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 18 ft. lengths. *f Hemlock *g No. 1 common. *j 8 ft. lengths. *k No. 3 common. *l Incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures. *m Up to 18" *R revised

PLYWOOD (Plyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, ⅜", $140.00; ½", $161.00. Exterior, waterproof, ⅜" $144.00; ½", $170.00. For other centers add rail freight increment from table on proper size. *a Lower rate by water shipment. *b 50,000 lbs. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950n

	Single or Double Strength A quality	B quality
Atlanta	78%e	78%e
Baltimore	74%d	76%d
Birmingham	82%	83%
Boston	72–10%	72–10%
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74–2–10%	74–2–10%
Dallas	76%	76%
Denver	74%	74%
Detroit	74–10–10%	74–10–10%
Kansas City	74–10–10%	74–10–10%
Los Angeles	70%	76%e
Minneapolis	71–10%	71–10%
Montreal	40–10–5%bc	40–10–5%b
New Orleans	75%	76%
New York	79–10%	79–10%
Philadelphia	74–10%	75–10%
Pittsburgh	72%	72%
St. Louis	72–10–10%	72–10–10%
San Francisco	60%–25%	68%–25%
Seattle	67%	72%

EXPLOSIVES

	Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	$0.2615
Baltimore	.2615
Birmingham	.2465
Boston	.2615
Chicago	.2615
Cincinnati	.2615
Cleveland	.3015
Dallas	.2690
Denver	.2665
Detroit	.2615
Kansas City	.2665
Los Angeles	.2640
Minneapolis	.2665
Montreal	22.05h
New Orleans	.2665
New York	.45g
Philadelphia	.2615
Pittsburgh	.2615
St. Louis	.2665
San Francisco	.2615
Seattle	.2640

Price of 60% Ammonia Gelatin is $0.16 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b sales tax extra. *c 77% or single strength. *d Discount 6/15/52. *e 77% for double strength.

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b. Beloeil (near Montreal), per 100 lb. forcite, 40%. Forcite 60% $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla and Me.	$0.2065	$0.2465	$0.2615
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.2115	.2515	.2665
Rocky Mtn. States	.2115	.2515	.2665
Pacific N. W. States	.2090	.2490	.2640
Pacific S. W. States	.2065	.2465	.2615

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	.....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	.....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	.....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	.....	.....
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	.....	.....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.50/68	.....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.93
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.88/93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	.....	1.00
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	.....	1.02

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie box carload lots:

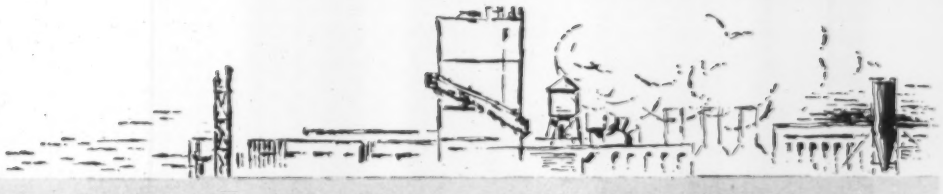
		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak		3.90a		4.50a
New York	S. L. Sap Pine	2.00	4.00	3.00	6.00g
	Mixed Oak	2.50	4.50	3.50	6.50g
Philadelphia	Red Oak	2.95/4.70	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	Mixed Oak	2.65	3.40a	2.90h	3.75ah
San Francisco	Douglas Fir	1.91ef	2.69ef	2.69ef	4.07cef

Tr.—Treated; Untr.—Untreated. a Creosoted. c Empty cell. eGreen f f.o.b. cars. g 7 x 9 x 8' 6" * Add 75c/tie freight charge to Birmingham. *h 7" x 9" x 9½"

CHEMICALS

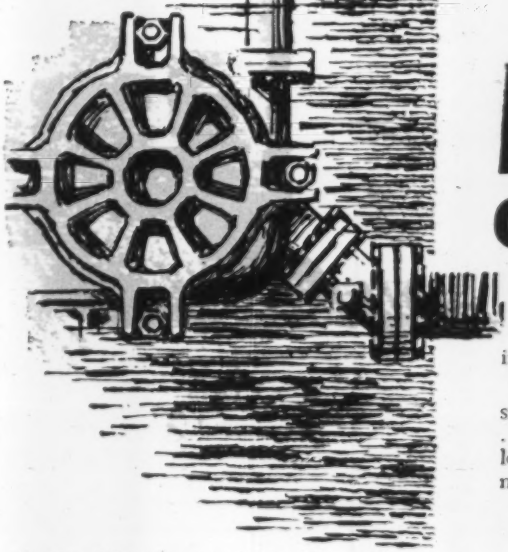
Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

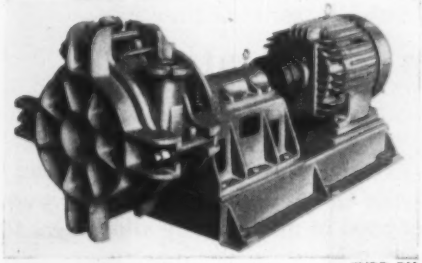


Industry problem: Pumping away pollution

Artist's sketch based on Morris pump installation for dust and gas control at lime manufacturing concern. Reprints of story describing this installation are available on request.



Two Type R Morris pumps used in this pollution control system pump 150 gal/min of corrosive slurry—ranging from 12% to 30% solids—against total dynamic heads which vary from 35 to 100 feet.



TYPE RX

MORRIS
Centrifugal Pumps

More and more, government at all levels is calling upon industry to prevent pollution of streams and air.

Engineers coping with this difficult problem are turning to systems of recirculated water to capture undesirable materials . . . reduce them to slurry . . . deposit them in unobjectionable locations . . . and recycle the reclaimed water. Morris has pioneered in the development of such systems.

CASE HISTORY: Dust from the plant of a leading lime manufacturer lay on the roofs of a nearby town like snow. Wastes were lethal to a formerly abundant stream life. Two Morris pumps were installed to furnish spray for wet dust collectors newly connected to each kiln. Two more Morris pumps lift the resulting slurry 40 ft., through 700 ft. of pipe, to deposit it in a mine abandoned by the company. The success of this system prompted the company to extend it to serve new kilns soon to be built.

Where efficient pumping performance must be maintained – even under adverse conditions – it pays to know your pump, *in advance*. Applications engineering for difficult problems is a standard part of Morris service.

Talk with our engineers. They are qualified to recommend pumps of modern hydraulic design that you can depend on for years of uninterrupted service.

MORRIS
CENTRIFUGAL
PUMPS

MORRIS MACHINE WORKS
BALDWINSVILLE, N. Y.

Sales Offices in Principal Cities • Export Office: 50 Church St., New York 7, N.Y.

"Transite's installation recent increases

Says Philip J. Holton, Jr.
Chief Engineer
Water Supply Board
Providence, R.I.

"Our records show that labor and material costs have increased 100% since 1946. Yet, in this same period of time, our installation costs have increased only 21%. The ease of handling and speed with which contractors can lay Transite Pipe enable us to take full advantage of modern equipment and methods. In this way, Transite has played a prominent part in helping us offset increased costs."

Transite Pressure Pipe helps you cut system costs 3 ways: in design . . . installation . . . operation!

Today, in every part of the nation, municipal and consulting engineers choose Transite® Pressure Pipe. Ask why, and you find that economy is always among the Transite advantages they consider most important. For no pipe does so much to help keep your costs low in three different areas:

1. Design. Transite lets you plan a system for maximum efficiency. For its high carrying capacity (flow coefficient, C=140) often lets you specify pipe of smaller diameter. And because Transite's smooth interior remains smooth, you never need to make costly allowances for future reduction in carrying capacity.

2. Installation. Transite's installation speed cuts time and labor costs substantially. Light in weight for so durable a pipe, it handles easily above and below ground. And its Ring-Tite Coupling assembles quickly, surely . . . giving you a tight seal at every coupling in the system.

savings have helped us absorb in labor and material costs..."

Crews of Fanning and Doorley Construction Co. installing 8" line in Providence, R. I.

3. Operation. Here's where Transite really saves! For its maintained carrying capacity keeps pumping costs low year after year. Its strength, durability and corrosion resistance cut maintenance to a minimum, provide years of trouble-free service.

Transite's Ring-Tite Coupling cut away to show how rubber rings are compressed and locked in place to form a tight yet flexible joint.

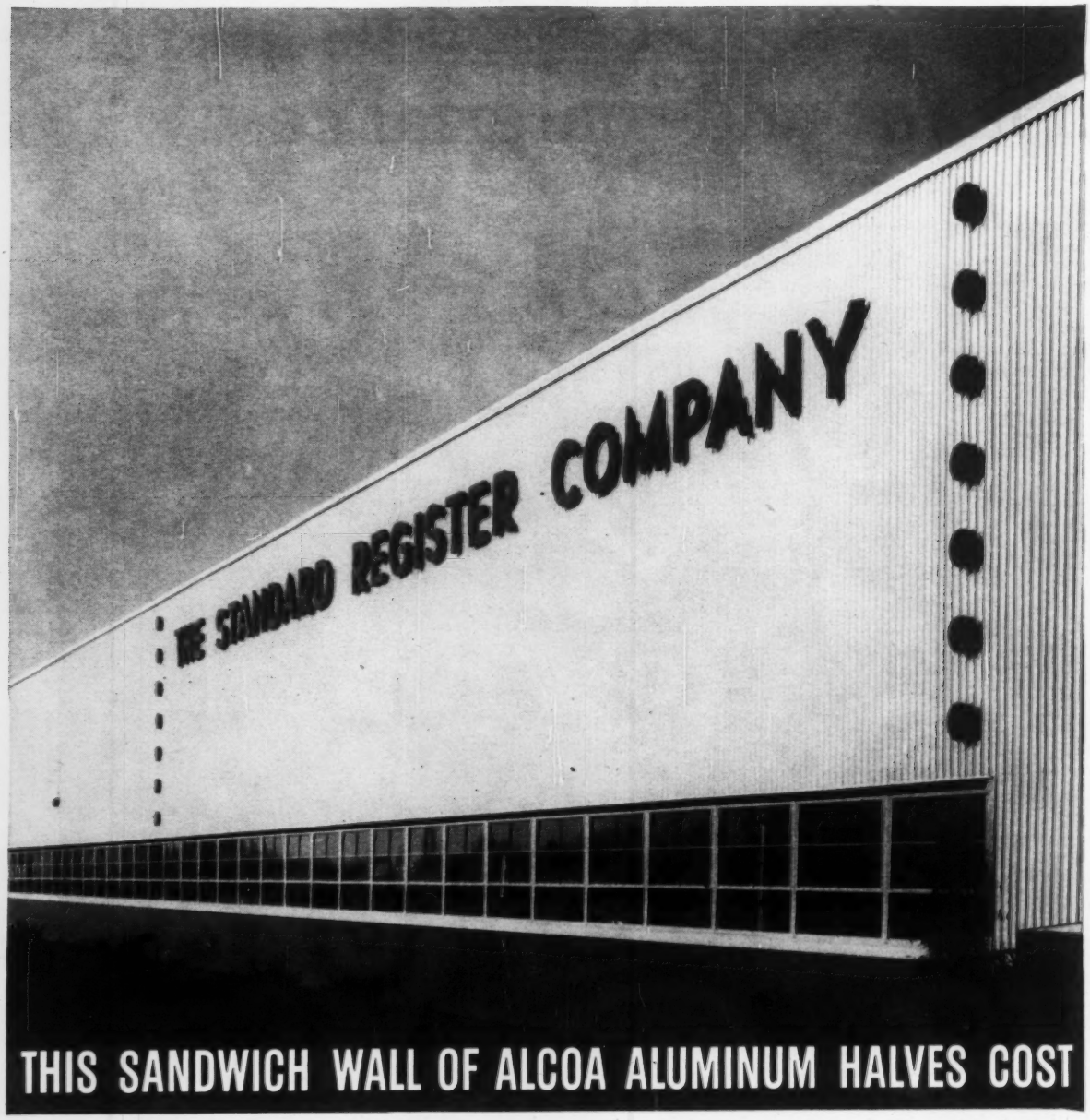
We'll be pleased to send you booklet TR-160A. Write Johns-Manville, EN Box 14, N. Y. 16, N. Y.

"Good Water, the Lifeblood of your Community" Let's promote it—Let's have it!

JOHNS-MANVILLE

100 YEARS OF QUALITY PRODUCTS . . . 1858—1958

JOHNS-MANVILLE JM PRODUCTS



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The Standard Register Company, Fayetteville, Arkansas, got the lowest cost insulated metal wall system known when it specified sandwich wall of Alcoa® Aluminum for its new 93,000 sq-ft building. Sandwich wall gives three times the insulating value of eight inches of brick, yet costs only about half as much.

Standard Register also knows aluminum's maintenance-free surface defies moisture, salt air, harsh industrial fumes . . . never needs painting or expensive repairs. This building will stay good-looking longer, with less care. Aluminum's lighter weight speeds erection, too; foundation and framing requirements are reduced, and less on-site labor and equipment needed.

GET MORE INFORMATION on sandwich walls of Alcoa Aluminum, and low-cost Alcoa building sheet in corrugated, ribbed and V-beam configurations. Applied by Alcoa Approved Applicators. Get the name of your nearest Applicator from your Alcoa sales office, or write Aluminum Company of America, 860-R Alcoa Building, Pittsburgh 19, Pa.

Building: The Standard Register Company, Fayetteville, Arkansas

Engineers and Builders: The Austin Company, Chicago, Illinois

Alcoa Approved Applicator: Lydick Roofing Company, Fort Worth, Texas

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INDUSTRIAL BUILDING PRODUCTS
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Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

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J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ RHODE ISLAND—State R. I. & Prov. Plants, State House, Providence, Bids opened 4/9,
M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I. LB $4,881,481, R. I. Bid NBR 783, Contr. NBR 5801, East Providence Expressway and East Shore Expressway link between Wampanoag Trail, East Providence. CD 3/21.

▲ CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,
C. W. Blakeslee & Sons, Inc., 58 Waverly St., New Haven, Conn. LB $3,891,670, est. $4,700,000. (9 bidders) Proj. 92-93, grading, drainage, incl. railroad bridge, over New York, New Haven & Hartford R.R. and 3 separation structures on relocation of Route No. 34, New Haven Co. Bids Apr. 10. CD 3/24.

BUILDINGS—LB & CA

▲† Davison Constr. Co., Inc., 1306A Elm St., Manchester, N. H., LB $8,382,000, HOUSING, Dow Air Force Base, Inv. 17-601-58-46, BANGOR, ME. Procurement Officer, Dow Air Force Base, Bangor, Me. Bids Apr. 10. CD 3/20.

▲ Gilbane Bldg. Co., 90 Calverley St., Providence, R. I., CA Approx. $2,500,000. INSURANCE OFFICE BLDG., South St., PITTSFIELD, MASS. Berkshire Life Insurance Co., M. W. Rankin Furey, pres., 7 North St., Pittsfield, Mass. Bids Mar. 25. CD 3/18.

▲ Daniel O'Connells Sons, Inc., 480 Hampton St., Holyoke, Mass. LB $1,777,376, HOSPITAL addn., alterations, Chestnut St., SPRINGFIELD, MASS. Springfield Hospital, 759 Chestnut St., Springfield, Mass. Bids Apr. 9. CD 3/12.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ N. Y., Buffalo—BA 5/27—Erie County Water Auth., Ellicott Square Bldg., 295 Main St., Zone 3, Sturgeon Point filtration plant and pumping station. $3,250,000. Buck, Seifert & Jost, 112 E. 19 St., New York, Zone 3, engrs. CD 12/20/55.

BUILDINGS—BA

▲† N. Y., Niagara Falls—HOUSING—BA On Or About 5/20—U. S. Eng., 111 E. 16 St., New York, Zone 3, housing at Niagara Falls Air Force Base. Over $4,000,000. Highland & Highland, 522 Franklin, Buffalo, Zone 2, archts.

HEAVY CONSTRUCTION—LB & CA

▲ PENNSYLVANIA—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
Fred W. Ewing, Inc., 405 W. Main St., Corry, Pa. CA $1,874,586, 16,159 ft. divided hy. c. conc. 24 ft. wide each side 56 ft. each divisor, 3 I-beam bridges, L.R. 797 (5) Proj. 802-1, Fairview and McKean Twps., section Erie Thruway. Bids Mar. 14, awarded Apr. 10. CD 3/19, under LB.

▲ PENNSYLVANIA—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,
Glasgow, Inc., Glenside, Pa. CA $3,945,670 constr. 22,999 ft. divided hy. rein.-con., 24 ft. wide each side divisor, 7 bridges, Media By Pass T. R. 1, Middletown, Upper Providence, Marple and Springfield Twps., Delaware Co. Bids Mar. 27, CD 4/1, under LB.

▲ PENNSYLVANIA—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
S. J. Groves & Sons Co., Box 8, East Springfield, Pa. CA $2,991,086 21,153 ft. divided hy. rein.-c. con. pavement 24 ft. wide each side earth medial area, 4 bridges, etc. L. R. 797 (1) Proj. 801-1 Springfield Twp., section Erie Thruway, Erie Co. Bids Mar. 14. CD 3/19, under LB.

BUILDINGS—LB & CA

▲ Torbank Constr. Co., c/o David Bogdanoff, 199 Main St., White Plains, N. Y., CA Est. $3,000,000, COOP HOUSING, 30 bldgs. for 188 families on 26 acre tract to be called High Meadow West, OSSINING, N. Y. United Nations International Coop Community, c/o Foundation for Coop Housing, 221 Fourth Ave., New York 3, N. Y. S. J. Kessler & Sons, 551 Fifth Ave., New York 17, N. Y., archts. CD 11/26/54, under N. Y., Briarcliff and Ossining.

SOUTH

BUILDINGS—BA

▲ La., Opelousas—HOUSING—BA 5/8—City Housing Authority, Yorick Chachere, dir., Opelousas, 140 brick veneer low rent housing. $1,535,800. Plans deposit $25. Matkin & Fitch, 3105 Ryan St., Box 5517, Drew Station, Lake Charles, archts. CD 9/14/56.

HEAVY CONSTRUCTION—LB & CA

▲† Williams Paving Co., 1269 East Princess Anne Rd., Norfolk, Va. LB $1,770,678 exten. runways, Naval Air Station, NBy 15292, Spec. 15292/58, OCEANA, VA. P. Wks. Office, 5th Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Apr. 10. CD 3/13.

BUILDINGS—LB & CA

▲† C. D. Spangler Constr. Co., 1028 S. Blvd., Box 3007, Charlotte, N. C., CA $4,370,372, Armed Services HOUSING, Robins Air Force Base, MACON, GA. Base Procurement Office at Civilian Employees Club, Bldg. 1683, Dormitory Area, City of Warner Robbins, Ga. Bids Mar. 20. CD 3/27, under LB.

MIDDLE WEST

BUILDINGS—BA

▲† O., Columbus—HOUSING—BA 5/7—Air Force Defense Dpt., Pentagon, Arlington, Va., 400-unit Capehart Housing, Lockbourne Air Force Base, ENG-33-617-58-53, $6,500,000. Extended date. CD 3/31.

▲ Wis., Sheboygan—HOME FOR AGED—BA 5/20—Sheboygan Co., 3 story bsmnt., 150 x 350 ft. home for aged, $2,000,000. Plans deposit $25. E. A. Stubenrauch & Assocs., 712 Erie Ave., archts. CD 5/1.

HEAVY CONSTRUCTION—LB & CA

▲† Loselle Constr. Co., 15351 Goddard, Wyandotte, Mich., CA $2,229,255, airfield pavements, incl. excav., pavement removal, topsoil and seeding, electrical facilities at Kinross U. S. Air Force Base, KINROSS, MICH. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Bids Apr. 2. CD 4/10, under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—LB & CA

▲† General Electric Co., 1 River Rd., Schenectady, N. Y. LB $8,896,305, 89,474 kva generators near Pierre, Oahe Reservoir Proj., SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Apr. 10. CD 3/13.

▲† H. N. Zachry Co., P. O. Box 10188, San Antonio, Tex. LB $2,530,324, est. $2,715,772, N-S RUNWAY "A" exten. runway primary/instrument; Taxiway 10 and Taxiway 11; airfield lighting storage base avfuel, medium A/C washrack, Reese Air Force Base, ENG-41-443-58-35, LUBBOCK, TEX. U. S. Eng., 100 W. Vickery Blvd., Fort Worth 2, Tex. Bids Apr. 10. CD 3/20.

BUILDINGS—LB & CA

▲ Johnson, Drake & Piper, Inc., Baker Bldg., Minneapolis, Minn., CA $2,114,809, general contract Glenwood Redevelopment Proj., Lyndale HOMES, 192 family units, Site Q, South, MINNEAPOLIS, MINN. Minneapolis Housing & Redevelopment Auth., Metropolitan Bldg., R. T. Horvig, exec. dir., Minneapolis, Minn. Bids Apr. 2. CD 4/8, under LB.

▲ Mainelli Constr. Co., 4502 S. 36th Omaha 7, Neb. CA $1,559,990 Horace Mann JUNIOR HIGH SCHOOL, OMAHA, NEB. Bd. Educ., 3902 Davenport, Omaha 31, Neb. Bids opened Apr. 8. CD 3/17.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ Green Constr. Co., Securities Bldg., Seattle, Wash., CA $3,345,000, tunnels, intakes and outlets as first phase for Bull Run, Proj. No. 2, Multnomah Co., PORTLAND, ORE. City, City Hall, Portland, Ore. Bids Mar. 28, awarded Apr. 10, CD 4/4, under LB.

▲ CALIFORNIA—State Div. Hys., 1120 N. St., Sacramento,
Piombo Constr. Co. M&K Corp. & Connolly Pacific Co., P. O. Box 935, San Carlos, Calif. CA $5,169,810 (joint venture) grading, paving, 2.5 mi. 6 lane freeway on Eastshore Freeway, U. S. Hy. 40 between 0.3 mi. south of El Cerrito Overhead in Albany and 0.2 mi. south of Jefferson St. in Richmond, incl. one 2,122 ft. bridge at El Cerrito Overhead IV Ala-CC 6., 7, alb. c. Rch. Alanda and Contra Costa Counties.. Bids Mar. 26, awarded Apr. 9. CD 3/28, under LB.

BUILDINGS—LB & CA

▲† Farnsworth & Chambers Co., Inc., Box 74, Houston, Tex., LB $1,357,779 (8 bidders) BLDGS., utilities for Gas Cooled Reactor Facility at National Reactor Testing Station, Idaho Falls, ARCO, IDAHO. Atomic Energy Comn., Idaho Operations Office, Idaho Falls, Idaho. Bids Apr. 9. CD 3/20.

▲ W. H. Wine Constr. Co., 2165 Plumas St., Reno, Nev. CA $1,241,288 (10 bidders) 55,400 sq. ft. telephone central OFFICE BLDG., 1st and Lake Sts., RENO, NEV. Bell Co. of Nevada, 151 W. St., Reno, Nev. Bids Apr. 1. CD 3/24.

▲ Donald M. Drake Co., 1600 N. W. Savier St., Portland, Ore., CA $7,746,252, Unit. 1; CA $7,643,311 Unit 3; Lloyd SHOPPING CENTER, PORTLAND, ORE. Lloyd Corp., Ltd., 720 N. E. 12th St., Portland, Ore. Grand total $21,429,395. Bids Feb. 27, awarded Apr. 11, CD 3/3, under LB.
Max J. Kuney, N. 120 Ralph, Spokane, Wash., CA $5,357,180, Unit 2, Lloyd SHOPPING CENTER, (Portland, Ore.);
Henry M. Mason Co., 2206 N. W. Thurman St., Portland, Ore., CA $682,652, Unit 4; Lloyd SHOPPING CENTER, (Portland, Ore.)

▲ Vinnell Co., Inc., 1145 Westminster Ave., Alhambra, Calif., CA $3,910,764, RESIDENCE HALLS, Units 1, 2 and 3 at Riverside Campus, RIVERSIDE, CALIF. Bd. Regents, University of California, Riverside Campus, Riverside, Calif. Bids Feb. 12. CD 2/17, under LB.

CANADA

BUILDINGS—BA

▲ Ont., Goderich—PLANT, etc.—BA 5/15—Dominion Rock Salt Co., Oxford St., Goderich, subsidiary of Dominion Tar & Chemical Co. Ltd., Sun Life Bldg., Montreal, Que., 3 main bldgs., 1 about 50,000 sq. ft. wood frame constr. and 2 bldgs. of about 30,000 and 4,000 sq. ft. structural steel frame constr., rein.-con. fdns., concrete block and brick walls, $2,300,000. Plans deposit $100. R. M. Way & Co., Ltd., 321 Bloor St. E., Toronto, engrs. CD 8/5.

▲ North West Territories, Aklavik—HOUSING—BA 5/28—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Federal Housing: Federal Bldg.; single staff quarters; Royal Canadian Mounted Police Bldgs., laundry and washhouse; fire hall; hospital; nurses' and ward aides' residence; garage; workshop and morgue, $5,000,000. Rule, Wynn & Rule, 11422 Jasper Ave., and Rensaa & Mineos, 9130 Jasper Ave., both Edmonton, Alta., archts. CD 3/6/56.

HEAVY CONSTRUCTION—LB & CA

▲ Ellis-Don Ltd., Box 352, London, Ont., CA $4,389,000, 1 story, 60x1250 ft., 2nd story, 60x500 ft., 3rd story 60x200 ft. plus a 36 ft. tower of curtain wall constr. rein.-con. fdn., rein.-con. columns (round) structural steel interior columns. International Terminal Bldg., at Halifax Airport, Kelly Lake, HALIFAX, N. S. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Jan. 16. CD 2/14, under LB.

BUILDINGS—LB & CA

▲ W. H. Cooper Constr. Co. Ltd., 21 Hunter St. E., Hamilton, Ont., CA EST $4,000,000, 3 story, 170,000 sq. ft. ENGINEERING FACULTY BLDG. University Ave. HAMILTON, ONT. McMaster University, Hamil-

(Continued on page 98)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

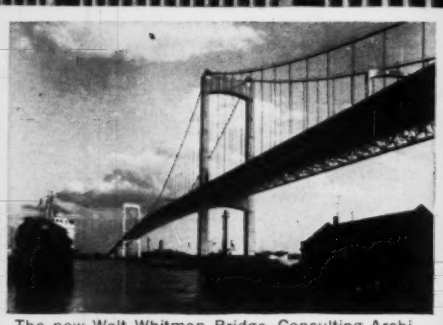
CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily



The new Walt Whitman Bridge. Consulting Architects: Harbeson, Hough, Livingston and Larson, Philadelphia. Consulting Engineer: George S. Richardson, Consultant to Turnpike Commission.

Photo taken during construction shows a two-man team installing prefabricated Flynn railing sections on the Walt Whitman Bridge. Work is clean, fast, easy—no need for heavy equipment or hoists.

NEW WALT WHITMAN BRIDGE:

Prefabricated Flynn railing cut days

The magnificent new Walt Whitman Bridge, reaching across the Delaware River between Philadelphia and Gloucester, N.J., has put Flynn first in bridge railing news again. To save erection time for the contractor, ten-foot-long sections of prefabricated Flynn post and rail were delivered direct to the job site, ready for fast, easy installation. With wrenches as their principal tool, a two-man-team put thousands of feet of this low-cost, lightweight aluminum railing in place—quickly, easily, and without power lifting equipment.

Years from now, these handsome Flynn extrusions will still be serving and saving money for the bridge authority. Because they can't rust, or rot, they'll never need painting or require costly maintenance.

Photograph by Cortlandt V. D. Hubbard

and dollars off construction costs

See this Walt Whitman Bridge railing in Flynn's free catalog. The baluster-type railing used on the Walt Whitman Bridge is one of many *standard designs* you'll find in Flynn's new bridge railing catalog. This valuable working tool contains details on dozens of "job-proven" profiles available to you for distinctive, low-cost bridge and highway construction. *For your free copy, write on your letterhead to Flynn's main office. Meanwhile, if you're planning a project at present, call the man from Flynn. He'll help you select the right railing, right away.*

MICHAEL FLYNN MANUFACTURING COMPANY

Aluminum Division

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Sales Offices:
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937 RADCLIFFE ROAD, TOWSON, MD. ..... Tel.: VAlley 3-2090
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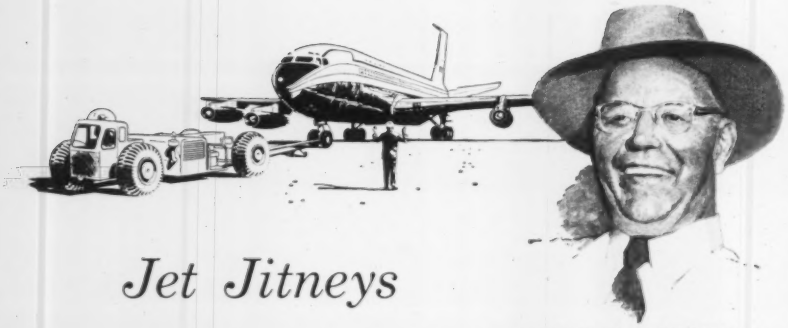
672 SOUTH LAFAYETTE PARK PLACE, LOS ANGELES 57, CALIF. Tel.: DUnkirk 7-3183
THOMAS BLDG., 1314 WOOD ST., DALLAS 2, TEXAS ..... Tel.: RIverside 8-5935

FLYNN ALUMINUM



Jet Jitneys

by R. G. LeTOURNEAU

The Electric Wheel we've been talking about from time to time has many uses. Whether in construction work, logging, land clearing or off-road transportation, every mobile machine on the job can have exactly the same propelling power.

The Electric Wheel machine we want you to know about today will do a different job — a job which is important and one which will affect you as you fly in the days to come.

A propeller-driven plane these days taxies out to the end of the runway and takes off. But with the jet plane this is too noisy and not economical enough, so they want a tractor to pull it out to the end of the runway.

Now, the traction required to move one of the big 250-ton jets is not out of the ordinary . . . but it must begin very slowly or else you'll jerk the wheels out from under. For it isn't practical to put enough metal in the jet's running gear — to make it strong enough — so that an ordinary tractor can "put 'er in low" and let out the clutch.

But what about the torque converter or hydraulic clutch, isn't that smooth enough? Well, our Electric Wheel is as much smoother than the torque converter as the torque converter is smoother than the ordinary friction clutch. And with the Electric Wheel you don't lose half or three-quarters of the power while you are getting started.

The fact is, we're sure our Air Tow Tractor is the answer to jet airplane towing. It offers you infinite ratios and continuous pull — from a speed so slow you would have to look twice to see if it was moving to full speed ahead, and *no shifting.*

With our Electric Wheel, as you design for a low silhouette, you are not hampered by shafts and gears or transmissions and clutches between the engine and the wheels. An electric wire does it all. All you have to do is decide how high from the man's feet to his head, and how high you want his feet off the ground, and that will be the height of the cab. That way, you'll have no trouble at all driving under the wings.

Then, for traction on hard-packed glare ice, we've got a fifth wheel right in the middle of the machine. This wheel has sharp spikes sticking out. All you do is press a button and electric-powered arms bring the wheel down to grip the ice. As the pressure comes on, the wheel will start turning at the same number of feet per minute that you want on your regular wheels — and out you go never mind how slick the ice!

Big soft LeTourneau-designed tires give you firm traction on soft ground and the spiked wheel gives you positive traction on smooth ice. Well, that's the LeTourneau system at work . . . the same system that's producing results in many industries, in many kinds of jobs.

We're specialists in knocking big jobs down to size, with big machines. If you've got a big problem that only a big machine can solve, get in touch with us. We'd like to help you get that job done better . . . faster . . . cheaper.

R.G. LeTourneau

LET
LeTOURNEAU EQUIPMENT

R.G. LETOURNEAU INC

2724 SOUTH MAC ARTHUR • LONGVIEW, TEXAS R-105

(Continued from page 95)

ton, Ont. Wm. R. Souter & Assocs., 36 James St. S., Hamilton, Ont. archts. C. C. Parker & Assocs. Ltd., 795 Main St. W., Hamilton, Ont., engrs. Awarded Apr. 3.

▲ **Ivanhoe Corp.**, c/o Steinberg's Ltd., 5400 Hochelaga St., Montreal, Que. Owner Builds, $2,500,000, SHOPPING CENTER, 1st Ave., CHARLESBOURG, QUE. Eliasoph & Berkowitz, 4950 Queen Mary Rd., Montreal, Que., archts. Engineer owner's staff and F. M. Kraus, 1966 Graham Blvd., Montreal, Que., engrs. CD 4/18/56.

▲ **Tellier & Groleau**, 2391 Place de Vaudreuil, Three Rivers, Que., CA $1,867,784, constr. 200 DWELLINGS, VALCARTIER, QUE. Central Mortgage & Housing Corp., Ottawa, Ont. M. P. McAndrew, regional constr. supt., 940 Cote de Liesse Rd., Montreal, Que. Bids Feb. 25, awarded Apr. 7. CD 3/6, under LB.

ALASKA

HEAVY CONSTRUCTION—BA

▲ **Alaska, Anchorage**—DOCK, etc.—BA 5/29—City, City Hall, 600 ft. dock and port facility, railroad trestle, hy. approaches, dredging 4 cranes. $7,000,000. Plans deposit $50. Tippetts-Abbett, McCarthy, Stratton, 62 W. 47 St., New York 36, N. Y., engrs. CD 6/11/56.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ore., Portland**—City, City Hall, dam and spillway to complete Bull Run No. 2 Project. $3,000,000. Stevens & Thompson, 2234 S.W. 5th Ave., consult. engrs. H. K. Anderson, City Hall, Portland, owner's staff engr. Bids late this summer or spring 1959.

SEWERS, WASTE DISPOSAL

▲ **O., Medina**—City, City Hall, exten. sewer lines and sewage plant expansion; incl. trunk line to hospital, north side trunk; W. Smith R. extension and SE trunk; State-Smith sub-trunk and relief interceptor to Harding and Harmony Sts., enlarging sewage plant. $1,500,000. Havens & Emerson, 640 Leader Bldg., Cleveland, Zone 14, consult. engrs. CD 11/9/53.

▲ **Ore., Oak Grove**—Oak Grove Sanitary Dist., Oak Grove, bond election Apr. 30, sewerage project. $1,200,000.

▲ **Pa., Bangor**—Borough of Bangor, Ralph Erdman, Council Pres., sewerage sys. and treatment plant Proj. No. PA36-P-3082. $1,466,200. Mast Eng. Co., Inc., 325 Washington St., Reading, consult. engr. CD 3/5.

▲ **Wash., Seattle**—City, County-City Bldg., Zone 4, treatment plant at West Point on Puget Sound, $11,500,000, completion in 6 years; interceptor sewer from Lake City treatment plant on Lake Washington to connect with North Trunk Sewer, $6,900,000, completion within 4 years; storm sewers in Windemere drainage area, $500,000, completion in 18 months; storm sewers in 40th Ave. N.E. trunk sewer area, $1,600,000, completion in 40 months; storm relief sewers throughout city, $1,600,000, completion in six years; parallel trunk sewers and holding tanks at points of overflow into Lake Washington, $1,500,000, completion in three years; treatment plant at Carkeek Park on Puget Sound, $1,100,000, construction about 1964; sanitary sewers to divert discharge into Lake Union and Portage Bay, $500,000, to be built this year. R. W. Morse, city engr.

▲ **Que., Notre Dame de Lorette**—Municipalite de Notre Dame De Lorette, Town Hall, sewerage system, incl. sewage treatment plant, $1,500,000. Marc Gilbert, 31 McMahon St., Quebec City, consult. engr. CD 12/24/53.

BRIDGES

▲ **PENNSYLVANIA**—State Hys. Dpt., 506 North Office Bldg., Harrisburg,

Chester Co.—bridge over Schuylkill River at Valley Forge and connections either with U. S. Rte. 202 or Pa. Turnpike, Interchange Valley Forge, $5,000,000 Baker-Wibberly & Assocs., Inc., 49 N. Jonathan, Hagerstown, Md., consult. engr. R. A. Farley, c/o owner, ch. engr.

STREETS AND ROADS

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

Schenectady Co.—3 mi. spur from Exit 35 of New York State Thruway to connect with Cross-Schenectady Hy.-Interstate Rte. 550. $3,000,000.

▲ **PENNSYLVANIA**—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,

Allegheny and Washington Counties—4 lane divided hy. between vicinity of Carnegie and Washington Pa. about 17½ mi., FAI, $33,500,000, Berger Assocs., Inc., Hall Bldg., Harrisburg consult. engr.

Allegheny Co.—4 lane divided hy. between Pa. Turnpike at Warrendale and vicinity of Carnegie 17½ mi. FAI, $37,480,000, Michael Baker Inc., Baker Bldg., Rochester, consult. engr.

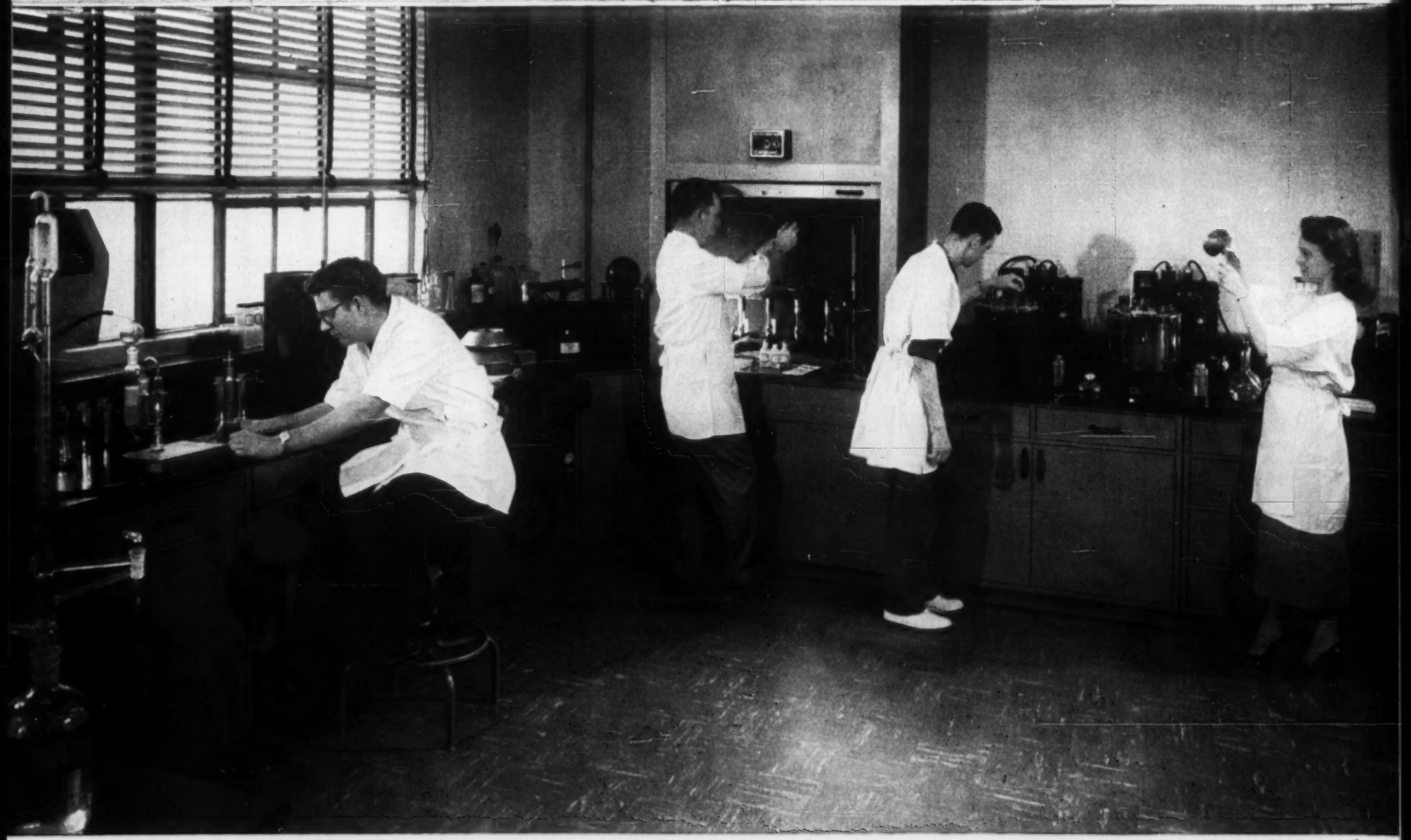
Delaware Co.—constr. 7.5 mi. limited access divided hy. between Delaware State line and point along the Chester Pike road to parallel Delaware River, FAI, $10,310,000, Damon & Foster, Chester Pike and High St., Sharon Hill, consult. engrs.

Philadelphia Co.—Vine St. Freeway from 17th and Vine Sts. to Benj. Franklin Bridge, FAI, $30,000,000, Lawrence T. Beck & Assocs. Inc., Alison Bldg., Rittenhouse Square, Phila. Zone 3, consult engr. R. A. Farley, c/o owner., ch. engr.

▲ **PENNSYLVANIA**—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,

Bradford and Wyoming Counties—reconstr. 29.4 mi. U. S. Rte. 6 between North Towanda, Bradford Co. and

(Continued on page 102



Are you throwing away good lube oil? Depending upon the sulfur content of fuel, often you can extend crankcase drain periods for appreciable savings in lube oil costs. D-A technicians will analyze your used engine oil and your fuel . . . then recommend maximum safe drain periods for your engines. Your local D-A Representative will be glad to outline this free money-saving service.

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Profitable new location for ready-mix producer tested with NOBLE-MOBILE . . . secured by NOBLE stationary plant

Producing concrete in an untested area with NOBLE-MOBILE is the practical way to confirm sales forecasts and profit-potential before investing in a permanent plant. San Gabriel Ready-Mixt, Pasadena, California, moved into the Inglewood area with a NOBLE-MOBILE on the basis of a rush contract for freeway paving while anticipating planned airport and industrial construction. Within 90 days, demand had substantially exceeded original estimates. Confident that big contracts based on quality controlled concrete and reliable delivery could be secured even against entrenched competition, San Gabriel rushed to completion the installation of a NOBLE stationary plant. Producing upwards of 125 cubic yards per hour, this NOBLE plant has overhead storage for 150 tons of aggregate in four sizes and separate overhead storage for 450 barrels each of two types of cement. Under construction is a 260 foot long combination cement screw and air slide from a rail siding. Six underground hoppers store a total of 1000 tons of aggregate. In addition to two gravel plants, San Gabriel Ready-Mixt operates transit-mix plants at 5 locations in the Los Angeles area and maintains one of the most extensive testing laboratories in the West.

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opening new areas of profit in to coast

NOBLE-MOBILE develops new business by extending the potential market to include profitable jobs ordinarily beyond economic range of conventional plants. Typical examples are presented below. Contractors, ready-mix producers and concrete products manufacturers use NOBLE-MOBILE in job-site batching to eliminate long expensive hauls. Easily and economically transported, NOBLE batching plant on wheels produces up to 125 cubic yards per hour of quality concrete to meet rigid specifications.

Lower transportation and erection costs of a NOBLE-MOBILE compared with conventional stationary plants allows Whitten Concrete, Stoneham, Mass., to operate profitably 140 miles from home base on the 15,000 cubic yard concrete job at remote Ball Mountain, Vermont, dam project. At the job site, NOBLE-MOBILE is also in position to handle concrete requirements of the proposed Townshend Dam 5 miles downstream. With typical output of 700 to 1,000 cubic yards per day, NOBLE-MOBILE can supply similar proposed projects in Springfield and Hartmann, Vermont. Concrete meets rigid specifications of Corps of Engineers. Batch weights are recorded automatically.

NOBLE-MOBILE produces dry batch, transit-mix or pre-mix. Aggregates loaded by scooploaders, conveyor or crane. Bulk cement storage silo with truck or rail receiving hopper, receiving screw and vertical screw. Weighs aggregates and cement separately and simultaneously. Automatic or semi-automatic controls. No field wiring. Minimum erection cost.

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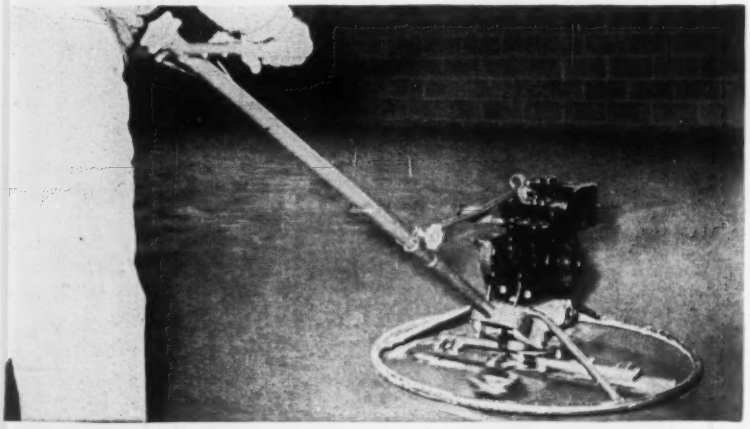

NEW STOW 4-BLADED ROTO-TROWEL MAKES FINISHING A *BREEZE*

Contractors the country over tell us the new 34-inch, 4-bladed Roto-Trowel is doing a fine job of finishing and floating concrete. Because the G34-4C has 4 blades, it runs smooth as silk and is highly maneuverable. Comes equipped with manual clutch control that stops the blades from rotating the instant the operator lets go of the handle, yet does not stop engine. This insures safety and allows easy starting of the engine at any throttle setting. Other G34-4C features are: lifting hook, pitch control on adjustable handle, 2.5 HP engine and stationary guard ring. The stationary guard ring allows the G34-4C to work right next to walls . . . makes for better finishing. The float and finish blades are reversible for double life; can be quickly changed by loosening wing nuts. The chrome-vanadium steel blades can be adjusted individually if necessary. Grinding blocks are available for attaching in place of blades.

A Complete Line of Concrete Construction Equipment.

Vibrating Screeds

Grinders

Roto-Trowels

Vibrators

SPECIFICATIONS FOR ROTO-TROWELS

Model No.	Trowel Dia.	Ring Dia.	Engine	Trowel Speed	No. of Blades	Float Trowel	Finish Trowel	Operating Weight
G-29	29"	30"	Briggs & Stratton 2.2 HP	35 to 130 RPM	3	6"x12"	6"x12"	70 lbs.
G-34	34"	35"	Briggs & Stratton 2.5 HP	25 to 110 RPM	3	10"x14"	6"x14"	130 lbs.
E-34	34"	35"	G.E. Fan-Cooled 1.5 HP	90 RPM	3	10"x14"	6"x14"	130 lbs.
G34-4C	34"	35"	Briggs & Stratton 2.5 HP	25 to 110 RPM	4	8"x14"	6"x14"	132 lbs.
G-42	42"	44.5"	3.6 HP	50 to 130 RPM	4	10"x14"	6"x14"	150 lbs.
G-46	46"	48.5"	Wisconsin BKN 6.8 HP	50 to 130 RPM	4	10"x18"	6"x18"	212 lbs.

STOW

Manufacturing Co.
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I'm interested in the Stow Line of Concrete Construction Equipment. Send a complete catalog and name of nearest distributor.

I am particularly interested in_____

Name_____ Title_____

Company_____

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(Continued from page 98)

Meshoppen, Wyoming Co., $29,000,000. Michael Baker, Jr., Inc., Baker Bldg., Rochester, Pa., consult. engr. R. A. Farley, co owner, ch. engr.

▲ **Va., Arlington**—Arlington Co. Bd., Courthouse, bond election May 13, street constr. $1,790,000; curb and gutter $330,000. CD 11/11/55.

▲† **ALASKA**—Bureau P. Rds., Dpt. Commerce, Juneau, extension of Big Lake South Rd. on Kineai peninsula to Mud Lake at end of Big Lake, $132,000
extension of Gohoe Rd. at Kasilof, $93,000
grading, drainage on Copper River Hy. near Cordova, $563,000
widening Copper River Hy. near Cordova, $500,000
grading, drainage, Denali Hy., $500,000
grading, paving Gambell St. from 4 Ave. to Firewood Lane, Anchorage $500,000
improvement and oiling of Portage Glacier Rd., $600,000
relocation of Glenn Hy. near Mile 49, $190,000
reconstruction and paving Sand Lake and Jewel Lake Rd., from Seward-Anchorage Hy. to intersection with Raspberry Rd., $496,000
grading, drainage Sterling Hy. for 21.4 mi. south from Soldotna, $1,400,000
grading, drainage Sterling Hy. Homer to Ninilchik, $3,048,000
extension of Wasilla-Willow Rd. 9 mi. from Houston, $500,000
paving 1 mi., Palmer, $197,000
paving Hy to dock Seward, $247,000. All above work scheduled for this year.

AIRPORTS

▲† **Calif., Lemore**—NAVAL AIR STATION—12th Naval Dist., P. Wks. Office, San Bruno, Naval Air Station 1st increment—2 runways, 13,500 ft. long each, taxiways, lighting, sewage utilities, Jet air Station, etc. $20,000,000. CD 1/23.

AMERICANS ABROAD

▲† **Finland, Helsinki**—OFFICE—Dpt. of State, Office of Foreign Bldgs., Wash., D. C., American Embassy Bldg. $1,500,000. Fred S. Dubin Assocs., 178 South Whitney St., Hartford, Conn., U. S. A., consult. engrs. CD 4/24.

PUBLIC BUILDINGS

▲ **Ala., Florence**—DORMITORIES, etc.—Florence State Teachers College, men's dormitory, women's dormitory student union bldg. $1,250,000.

▲ **Calif., Orange**—SCHOOL—Orange Unif. School Dist., voted bonds Feb. 11 elementary school, $1,252,000, and high school, $1,250,000. CD 12/2.

▲ **Calif., Pasadena**—SCHOOLS—Pasadena Unified High School Dist., 351 S. Hudson Ave., $8,000,000 bond election June 3, High School Distr. Schools. CD 8/12.

▲ **Calif., Pasadena**—JUNIOR COLLEGE DIST.—Pasadena Unif. School Dist., 351 S. Hudson Ave., $5,000,000 bond election June 3 Junior College Dist. Schools.

▲ **Calif., Santa Ana**—ENGINEERING—Orange Co., Court House, plans by Wm. L. Faulkner, Spurgeon Bldg., Santa Ana, 3 story, 76,000 sq. ft. engineering bldg. Unit 2 at 8th and Broadway. $1,500,000.

▲ **Mich., Greenville**—SCHOOLS—Bd. Educ., A. F. Allinder, supt. Schools, bond election May 6, schools. $2,950,000.

▲ **Mich., Sturgis**—SCHOOL—Bd. Educ., Sturgis School Dist., defeated bonds, school program. $3,000,000. CD 2/26.

▲ **Minn., Circle Pines**—TREATMENT CENTER—State, Dpt. Admin., 120 State Capitol, A. J. Nelson, state archt., St. Paul, plans by W. Butler Co., Inc., 1300 Minnesota Bldg., St. Paul, treatment center for emotionally disturbed children, 2½ mi. northeast of here. $4,000,000.

▲ **Mo., Maplewood — Richmond Heights**—SCHOOLS—Maplewood-Richmond Heights School Dist., E. R. Adams, supt. Schools, 7539 Manchester Rd., Zone 17, defeated $1,200,000 bonds Apr. 1, school imprvs. incl. addn. Sutton Elementary School, girls' gymnasium at Maplewood Senior High School; gymnasium at West Richmond School, addns., etc. at other schools. Pearce & Pearce, Inc., 721 Olive St., St. Louis, Zone 1, archt. CD 3/19.

▲ **Mo., St. Louis County**—SCHOOLS, etc.—Lindberg School Dist., Bd. Educ., Noah E. Gray, supt. Schools, 4900 S. Lindbergh Blvd., Zone 23, voted $1,000,000 bonds Apr. 1, school imprvs. incl. 21-room elementary school in Crestwood area; swimming pool addn. etc. for high school and other addns. and facilities for various schools. Charles W. Lorenz, 700 N. Ballas Rd., Kirkwood 22 Mo., archts. CD 3/19.

▲ **Mo., Springfield**—SCHOOLS—Bd. Educ. Reorganized School Dist. R-12, James A. Jeffries, pres., 940 N. Jefferson Ave., Springfield, defeated $1,750,000 bonds Apr. 1, 2 elementary schools, Senior High School Auditorium and addns. Junior High School and 2 elementary schools. CD 1/3.

▲ **Neb., Fremont** — HOSPITAL — Bd. Supervs. Dodge Co. C. H. Dahl, clerk, Fremont, voted $500,000 bonds Mar. 4, 120 bed with kitchen and laundry hospital addn. $1,275,000. CD 2/10.

▲ **Neb., Omaha**—SCHOOL—Bd. Educ., 3902 Davenport, Omaha 31, plans by Leo A. Daly, 633 Ins. Bldg., Zone 2, addn. to Westside High School. $1,150,000. CD 1/28/55.

▲ **N. J., Boonton**—SCHOOL—Bd. Educ., 612 Main St., plans by Mickleweright & Mountford, E. Stuyvesant Ave., Trenton, high school. $1,000,000.

▲ **N. J., Perth Amboy**—HOSPITAL—Perth Amboy General Hospital, 530 New Brunswick Ave., plans by

Ferrenz & Taylor, 152 West 42 St., New York 36, N. Y., north wing to existing hospital, $2,500,000.

▲ **N. Y., Amityville**—SCHOOL—Bd. Educ., bond election late in May, high school. $3,000,000. Knappe & Johnson, 2110 Northern Blvd., Manhasset, archts.

▲ **N. Y., Eastchester**—SCHOOLS—Bd. Educ., voted bonds Mar. 15, addns. to 4 elementary schools and central school bldg. $2,300,000. Knappe & Johnson, 2 Overhill Rd., Scarsdale, archts.

▲ **N. Y., Elmsford**—SCHOOL—Bd. Educ., Elmsford, plans by Knappe & Johnson, 2 Overhill Rd., Scarsdale, elementary school and addn. to Alexander Hamilton School. $1,000,000. Bids in June.

▲ **N. Y., Endicott**—SCIENCE—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany, plans by Moore & Hutchins, 800 Second Ave., New York, Zone 17, science bldg. at Harpur College for State University of New York. $2,650,000. Bids in 1958. CD 3/26.

▲ **N. Y., Great Neck**—SCHOOL—Bd. Educ. plans by Moore & Hutchins, 800 Second Ave., New York, Zone 17, Redbrook Elementary School. $2,000,000.

▲ **N. Y., Lockport**—COUNTY JAIL—Bd. Supervs., Niagara Co. Court House, county jail. $2,000,000.

▲ **N. Y., Jericho**—SCHOOL—Bd. Educ., plans by Knappe & Johnson, 2110 Northern Blvd., Manhasset, N. Y., Junior-Senior High School. $3,500,000. Bids in June. CD 12/3.

▲ **N. Y., Tonawanda**—SCHOOL—Sweet Home Central School Dist., Tonawanda, voted bonds Mar. 28, 20-room elementary school. $1,045,000.

▲ **N. Y., West Babylon**—SCHOOL—Bd. Educ. plans by Knappe & Johnson, 2110 Northern Blvd., Manhasset, Senior High School. $2,750,000. Bids in May.

▲ **O., Dayton**—LIBRARY—City of Dayton-Montgomery Co. Library Trustees, Courthouse, plans by Freeman A. Pretzinger, Reibold Bldg., main library. $2,400,000. CD 2/27.

▲ **O., Hamilton**—JAIL, etc.—Comrs. Butler Co., Court House, plans by Frederick J. Winkler & Assocs., archts., Dollar Federal Bldg. and Hair, Siegel & Steed, assoc. archts., 10 Court St., both Hamilton, O., court house and jail, $2,500,000. CD 11/12/56.

▲ **Pa., Chester**—SCHOOLS—Chester City School Dist., 9th and Crosby Sts., 2 secondary schools, at $1,500,000 each.

▲ **Pa., Sewickley**—HOSPITAL—Sewickley Valley Hospital, constr. hospital bldg. $1,500,000.

▲ **Pa., Springfield Twp.** (P. O. Chestnut Hill, Phila. 18) —SCHOOL—Springfield Twp. School Dist., Chestnut Hill, Phila. Zone 18, Secondary School Bldg. $2,362,165.

▲ **Pa., Willow Grove**—SCHOOL—Upper Moreland Twp. School Dist., Willow Grove, secondary (high) school bldg. $2,030,000.

▲ **Tenn., Elizabethton**—HOSPITAL—Carter Co., Bd., Elizabethton, Carter County Memorial Hospital $1,200,000.

▲ **Tex., Waco**—SCHOOL—Waco Ind. School Dist., plans by Spicer, Bush & Witt, 2125 Austin St., Senior High School. $1,200,000. CD 4/8.

▲† **Tex., Wichita Falls**—HOUSING UNITS—Strategic Air Command, c/o Sheppard Air Force Base, plans by John W. Floore, 1401 W. Lancaster, Fort Worth, brick, veneer concrete slab, etc. 500 Capheart Housing units (1 family and duplexes) $7,000,000. CD 8/21/56, under Unclassified etc.

▲ **Va., Arlington**—SCHOOLS—Arlington Co. Bd., Courthouse, bond election May 13, schools. $3,500,000. CD 6/7/56.

▲† **W. Va., Charleston**—COURT HOUSE AND FEDERAL OFFICE—General Services Admin., 18 and F Sts., Wash. 25, D. C., plans by C. E. Silling & Assocs., Masonic Temple, and Greife & Daley, Payne Bldg., court house and federal office bldg. $3,820,000. CD 12/13.

▲ **Wis., Mequon** (Thiensville P. O.)—SCHOOL—Thiensville-Mequon Union High School Dist. No. 1, plans by John J. Flad & Assocs., 2525 University Ave., Madison, high school. $1,750,000.

▲ **Ont., Port Arthur**—HOSPITAL—Ontario Dpt. P. Wks., Parliament Bldgs., Toronto, two pavilions, maintenance shop, garage medical bldg., etc. addns. at Provincial Hospital, $1,000,000.

▲ **Ont., Sarnia**—ADMINISTRATIVE—County of Lambton, D. B. Gardner, co. engr., 283 N. Christina St., plans by Riddle, Connor & Assocs., 560 Exmouth St., administrative bldg. $1,500,000. CD 6/25.

COMMERCIAL BUILDINGS

▲ **Ark., Little Rock**—OFFICE—Collie, Inc., 610 W. 3 St., plans by Wittenberg, Delony & Davidson, archts.-consult. engrs., Pyramid Life Bldg., 16 story brick, concrete, steel, aluminum and glass office bldg. $2,000,000.

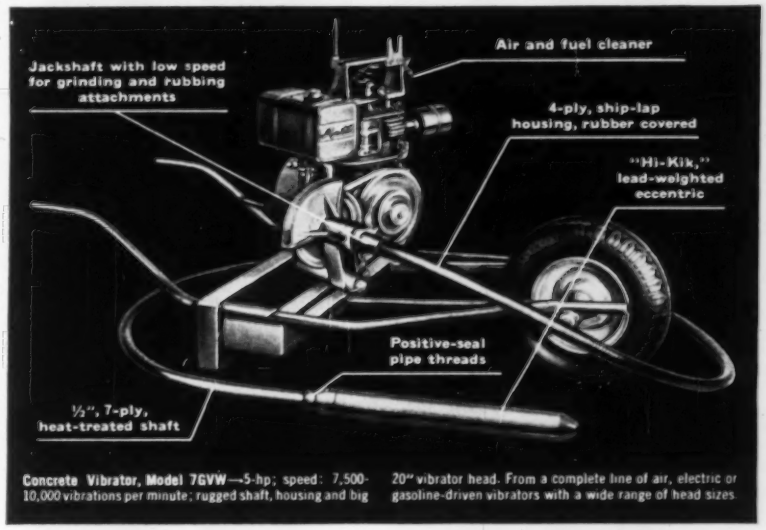
▲ **Colo., Denver**—OFFICE—Capitol Properties Co., c/o John Lort, Jr., archt., 211 Clayton St., 9 story, rein.-con. office. $2,200,000.

▲ **Fla., Ocala**—POST OFFICE-COURT HOUSE—General Services Admin., General Services Bldg., Wash. 25, D. C., plans by Kemp, Bunch & Jackson, 33 S. Hogan St., Jacksonville, post office and court house (lease-purchase program). $1,580,000. CD 10/2/56.

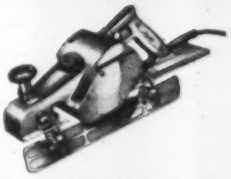
▲ **Kan., Overland Park**—SHOPPING CENTER—Win-Rau Corp., 5407 W. 103, shopping center, "Nall Hills", 95th and Nall Ave. $1,500,000.

▲ **Ky., Louisville**—STORE—Sears Roebuck, S. State and E. Van Buren, Chicago, Ill., plans by Dunlap & Edgar,

POWER to boost job efficiency with REMINGTON tools

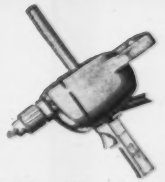

Jackshaft with low speed for grinding and rubbing attachments
Air and fuel cleaner
4-ply, ship-lap housing, rubber covered
"Hi-Kik," lead-weighted eccentric
Positive-seal pipe threads
½", 7-ply, heat-treated shaft

Concrete Vibrator, Model 7GVW—5-hp; speed: 7,500-10,000 vibrations per minute; rugged shaft, housing and big 20" vibrator head. From a complete line of air, electric or gasoline-driven vibrators with a wide range of head sizes.



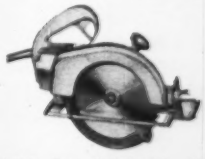
Planer, Model 3P—Sealed transmission and bearings; 3" width; depth adjustable, 0-⅛"; full-grip rear handle with trigger switch; 8.4 amp, AC/DC motor. Speed: 13,500 rpm.

Pneumatic Chain Saw, Model 2P—Heavy-duty; 18", 24" or 30" bar; roller bearing nose for fast cutting, longer bar life; automatic motor oiler; trigger throttle in hand grip.

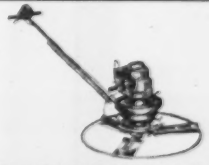


Electric Drill, Model 125—½" capacity; geared key-type chuck; 5-amp motor; removable auxiliary handle; ball and needle bearings; weight: 8½ lbs.; free speed 500 rpm.

Powerful, rugged, easy to handle—Remington Power Tools help you boost output and ease the tough jobs. They're precision-built for long service and minimum maintenance. Your Remington distributor stocks and services the industry's widest selection of power tools and parts.



Electric Saw, Model 108—10" blade; 13-amp motor with powerful worm drive; cuts full 3⅛"; complete with combination blade, wrench and steel carrying case.



Power Trowel, Model TG4-36—2¼-hp, 4-cycle, gasoline-powered engine; 36" ring size; automatic-recoil starter; centrifugal clutch disengages at idle; safety throttle control.

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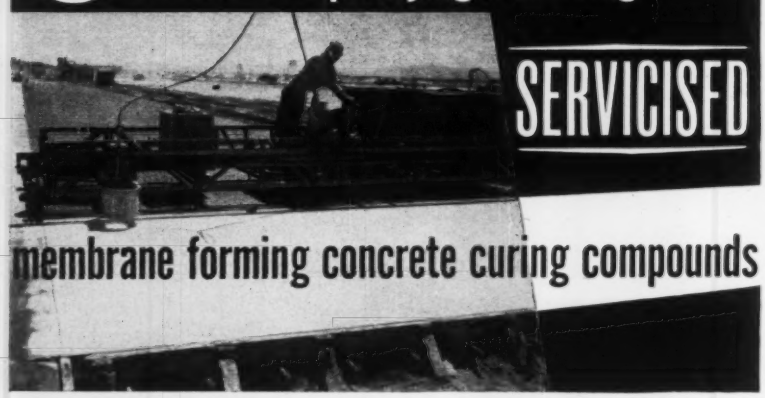
6 reasons for specifying and using SERVICISED membrane forming concrete curing compounds



1. Provide lowest unit of moisture loss
2. Meet official specifications for each particular type
3. Sprayed or painted on vertical surfaces, they will "stay put"
4. Save time, labor, material
5. Will not cake in the drum
6. Guaranteed uniform quality and results

WHITE PIGMENTED TYPE

Servicised White Pigmented Curing Compound provides a film or membrane capable of reflecting heat. It is widely used in areas where atmospheric temperatures exceed 80°F., and properly applied, will reduce concrete temperatures approximately 15°F. Excessively high temperatures during the early hardening period tend to jeopardize setting of concrete and reduces its final strength. High quality inert pigments added to the basic compound also prevent too thin or uneven coverage, as improper application is readily seen. Used on all U. S. Engineers work.

CLEAR TYPE

Servicised Clear Curing Compounds are available in both Wax-Resin and Resin Base Types. Only pure synthetic resins are used with carefully controlled proportions of oils and waxes, etc., in a petroleum solvent to insure a clear, impermeable membrane. Both types can be supplied with a fugitive dye which materially assists in securing proper coverage, and which disappears after application.

WAX-RESIN BASE. A general purpose compound, usually used on mass concrete, pavements. Has excellent water retention properties, allowing slow curing of the concrete which eliminates checking. Dries rapidly and forms a film of uniform texture.

RESIN BASE. Recommended for buildings, offices, architectural concrete, etc. The pure resins, oils and other ingredients present a clear film which does not materially alter the appearance of concrete and it permits early application of adhesives, paint, etc.

AIR ENTRAINING AGENT

Servicised Air Entraining Agent is a highly active, homogenous and clear solution. A relatively small quantity produces maximum air dispersion, yet it is not so critical as to create wide fluctuations in the amount of entrained air should slight variations in the amount used occur. It will not settle out in storage or gum the dispenser, and its action is not jeopardized by the presence of Calcium Chloride. Servicised Air Entraining Agent meets all official specifications, comes ready to use and requires no additional ingredients or treatment before being used. Available in 5 gallon and 55 gallon drums.

Write for special circulars on Curing Compounds and Air Entraining Agent

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333 N. Michigan Ave., Chicago 1, Ill., store, Shelbyville Rd., St. Matthews. $1,000,000.

▲ Md., Wheaton—STORE—Woodward & Lothrop, 10th and F Sts. N.W., Wash., D. C., plans by A. L. Anderson, 1726 L St. N.W., Wash., D. C., 3 story, 150,000 sq. ft. air-conditioned branch store and community auditorium, Viers Mill Rd., University Blvd. West and Georgia Ave. $3,000,000.

▲ N. Y., Buffalo—BANK—Owner, c/o Lawrence A. Wien, 60 E. 42 St., New York, plans by Duane Lyman & Assoc., 505 Delaware Ave., Buffalo, Zone 2, 60,000 sq. ft. addn. to Liberty Bank Bldg. on site of Charles Bldg. $1,400,000. CD 11/27.

▲ N. Y., New York—APARTMENT—William R. Buxbaum, c/o Sylvan Bien, archt., 36 W. 46 St., New York, Zone 19, 19 story apartment, 900 Fifth Ave. near West 71 St. $2,000,000.

▲ N. Y., New York—APARTMENT—Cortlandt Gardens, Inc., 3957 Provost Ave., Zone 66, plans by Leo Stillman, 332 E. 149 St., Zone 51, 6 story apartment at Van Cortlandt Park East, s. e. c. of East 230 St. $1,000,000.

▲ N. Y., New York—OFFICE—Henry Phipps Estate, 800 Second Ave., Zone 17, plans by Raymond & Rado, 101 Park Ave., Zone 17, altering office bldg. 607-9 Fifth Ave. $1,750,000.

▲ N. Y., New York—APARTMENT—174 E. 74 St. Corp., 400 Madison Ave., New York, Zone 17, plans by A. Roilin Caughey, 165 E. 72 St., Zone 21, 17 story apartment, 174 E. 74 St. and 1280-88 Third Ave. $1,400,000.

▲ O., Columbus—BOWLING ALLEY—Star Lanes, Inc., c/o Eugene W. Butler, 150 E. Broad St., Columbus, O., constr. 32-lane bowling alley with parking facilities, 1400 Dublin Rd. $1,000,000.

▲ O., Mayfield—HOUSING—Carl A. DeFranco, 5196 Case Ave., Cleveland, Zone 24, 49 contemporary ranch homes on 30-acre site at NE corner Wilson Mills & SOM Center Rd. Elsena Acres. $1,700,000. Constr. about July.

▲ O., Painesville—SHOPPING CENTER—E. M. Weyls & Assocs., Mentor, plans by Freshwater, Harrison & Assocs., 3763 N. High St., Columbus, 128,000 sq. ft. shopping center, Route 84 and Madison and Vrooman Rd. $4,000,000.

▲ Pa., Langeloth—RETARDED CHILDREN CENTER—Sixth Diocesan Dist. of Greek Orthodox Archidiocese 5201 Ellsworth Ave., Pittsburgh retarded children center for the orphaned and aged. $1,000,000.

▲ Tex., Amarillo—DEPARTMENT STORE—Owner, c/o Rob. W. Boston, 1418 W 15th St., 674 x 184 ft. masonry department store, NE corner Wolfin and Georgia Sts. $1,000,000.

▲ Tex., Houston—SHOPPING CENTER—Glenbrook Valley Corp., c/o D. S. Tuley & Assocs., 8315 Dover, shopping center, a Mobile Homesites Subdivision, off 6100 block, Spencer Hy. $2,000,000.

▲ Wash., Seattle—APARTMENT—Rochdale House, Inc., c/o S. Petersky, 115 15 Ave. N., plans by G. Bolotin & Assocs., 915 E. Pine St., 13 story rein.-con. apartment. $1,500,000.

▲ Wash., Seattle—HOME DEVELOPMENT—White & Bollard, Inc., 2333 3 Ave., Zone 1, 100-home development with streets, utilities, swim pool, etc., Newport Hills, east of here. $30,000,000.

▲ Wis., Milwaukee—COLLEGE—Sisters of St. Francis of Assisi, 3195 S. Superior St., plans by E. Briel-maier & Sons Co., 735 N. Water St., Zone 2, Cardinal Stretch Women's College, incl. admin., academic, library, residence hall, dining hall, science, and fine arts bldgs., Glendale. $1,000,000.

INDUSTRIAL BUILDINGS

▲ Ky., Louisville—PLANT—Louisville Gas & Electric Co., 311 W. Chestnut St., Zone 2, Phase 4: expansion of power plants at River Rd. and Cane Run Rd., incl. 125,000 kw capacity generating unit, 1 turbine steam boiler, coal fired. $20,000,000. Pioneer Service & Eng. Co., 231 S. LaSalle St., Chicago, Ill., consult. engr. CD 12/23.

▲ N. J., Fair Lawn—DISTRIBUTION OFFICE—Coats & Clark, Inc., 264 Ogden St., Newark, 139,000 sq. ft. distribution office, Rte. 208. $1,000,000.

▲ Ont., London—PLANT—John Thompson-Leonard Ltd., 381 York St., plant, London Twp. $1,000,000. Constr. expected in 18 months.

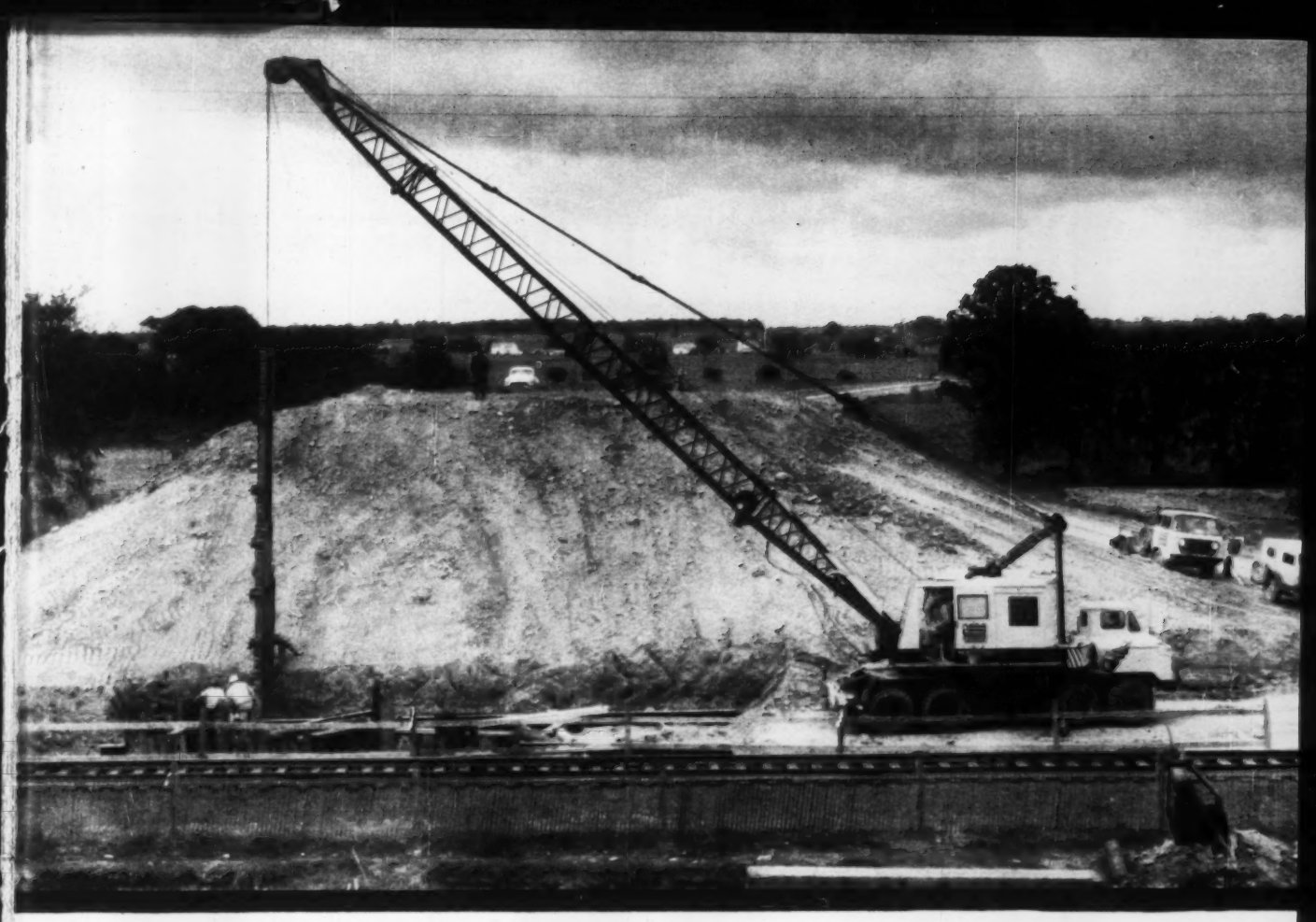
UNCLASSIFIED

▲ Kentucky—GAS LINES—Kentucky Gas Transmission Co., 1700 MacCorkle Ave. S. E. Charleston, W. Va., 20½ mi. natural gas lines in Bracken and Campbell Counties. $2,191,400.

▲† Ohio—NIKE SITE—U. S. Eng., New Post Office Bldg., Pittsburgh, Pa., east Cleveland area Nike site, Painesville. $1,250,000. J. Gordon Turnbull, 2630 Chester Ave., Cleveland, Zone 14, consult. engr. Bids expected last of May, constr. in July. CD 1/28.

▲ Tenn., Knoxville—DIESEL LOCOMOTIVE, CAR REPAIR, BUILDING SHOP—Southern Ry. Co., (Central Line) R. D. Midkiff, ch. engr., 101 Gay St. N.W., diesel locomotive and car repair and bldg. shop. $1,500,000. W. H. Oglesby, c/o owner, engr. CD 12/8/49.

▲ Texas—GAS LINES—El Paso Natural Gas Co., El Paso Natural Gas Bldg., El Paso, 177 mi. 20 in. natural gas line from Sonora Plant to Plains Plant, Sonoro, in Sutton and Yoakum Counties. $5,310,000; 18 mi. 12 in. gas line between Good Field in Bordon Co. to area, Howard Co., Big Spring area. $265,000.



40-TON GRADE SEPARATOR

Pile driver service is only one side of the busy life of this Marion 43-M Truck Crane. Here it uses a 70-foot boom and 40-ton muscles to pin down an Ohio grade separation footer. Any operator looks better than ever with a 43-M torque converter, Marionair Control and a foot accelerator working for him and with him. Loads, light or heavy, move slowly or quickly, at will, and spotting and holding the load comes easy. Your Marion Distributor has big news for you about fast, economical multi-service truck, wagon and crawler cranes.

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MACHINE	Shovel Capacity	AVAILABLE AS . .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	—
43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—

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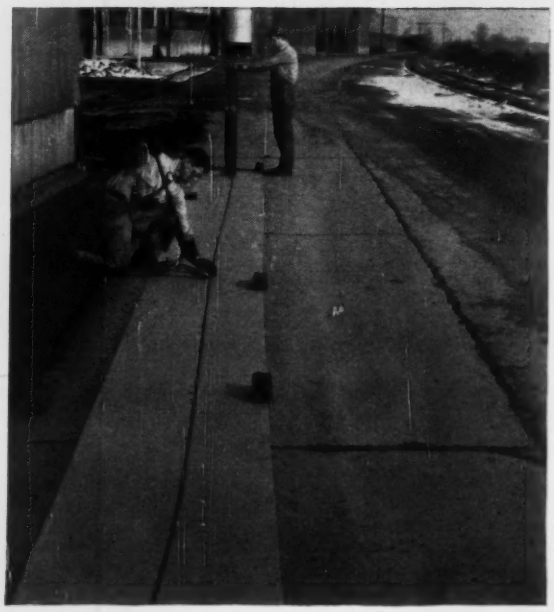
On the Wolcott Avenue Bridge

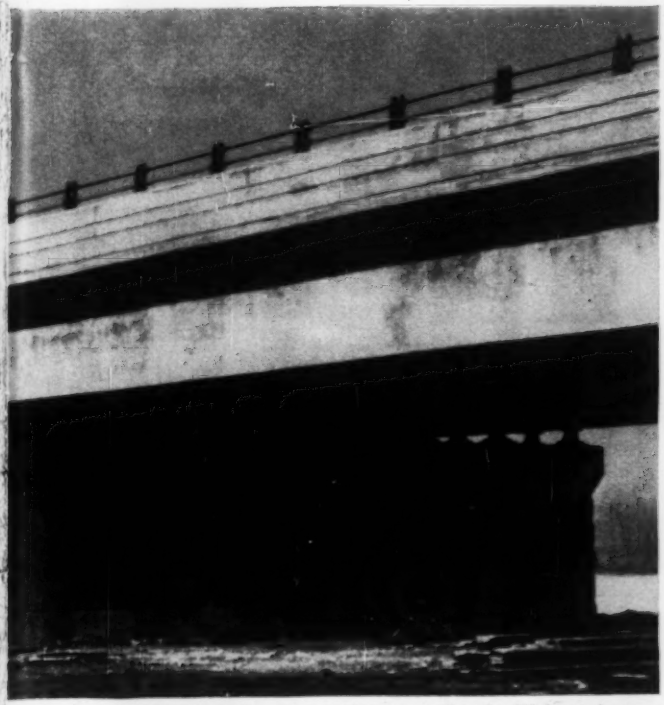
extraordinary straightness of new



Above—This is a partially completed reinforcing assembly for girders in the Wolcott Avenue Bridge. Super-Tens Wires have been inserted in six of the twelve flexible metal tubes in this particular assembly.

Left—This photo emphasizes the superior straightness of USS American Super-Tens Stress-Relieved Wire as it is uncoiled. It stays straight and lies flat, with no tendency to curl, which greatly simplifies handling.

USS American Stress-Relieved Wire solves on-site prestressing problem



Fabrication of prestressed concrete for the Wolcott Avenue Bridge was made much simpler through the use of *new* USS American Super-Tens Stress-Relieved Wire. Super-Tens is unusually *straight* prestressing wire. It stays straight . . . lies flat. This development has solved a major problem facing the manufacturer of prestressed concrete.

120-Foot Beams Prestressed Without Difficulty

The Wolcott Avenue Bridge, near Hartford, Connecticut, is a new cast-in-place, slab and girder bridge construction. It is built of concrete girders post-tensioned on the job with an amazing new product, USS American Super-Tens Stress-Relieved Wire.

This wire has straightness and handling ease never before realized in the field of prestressed concrete. New Super-Tens Stress-Relieved Wire developed by American Steel & Wire eliminates the tendency of wire to return to its original shape. This tendency has been a major problem in making up parallel-wire, post-tensioning assemblies. By using new, *straight* Super-Tens Stress-Relieved Wire, however, the builders of the Wolcott Avenue Bridge not only saved time on the prestressing operation, but did the job more efficiently.

Spans are 120 feet long; girder webs are seven feet deep and twelve inches wide. The Freyssinet post-tensioning system was used. Each cable contains twelve 0.276″ diameter USS American Super-Tens Stress-Relieved Wires.

Perfecting a straighter prestressing wire is the latest milestone for American Steel & Wire engineers, leaders in the application and development of steel wire and strand for prestressed concrete. If you are interested in prestressed concrete construction, get in touch with us today through our nearest Sales Office. Or write to American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

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These are the people who built this bridge:

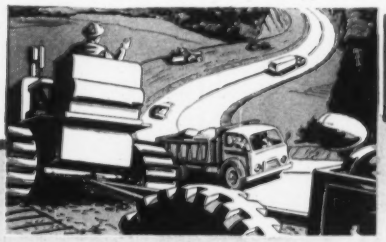
Owner: The Greater Hartford Bridge Authority
General Contractor: Merritt-Chapman & Scott Corp., New York
Designing Engineer: Thomas Worcester, Inc., Boston
Supervising Engineer: DeLeuw, Cather & Brill, New York
Consulting Engineer for Contractor: The Preload Co., Inc., New York

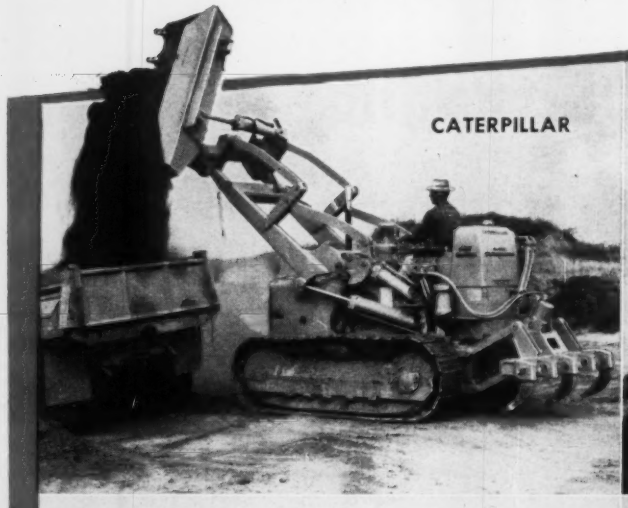
American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

BLOOD BROTHERS Universal Joints

"get the power through" to make our highways come sooner . . .





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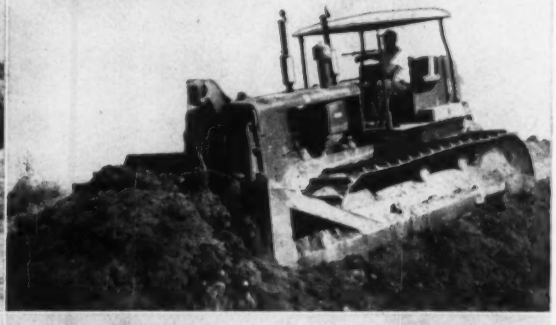
INTERNATIONAL



MICHIGAN

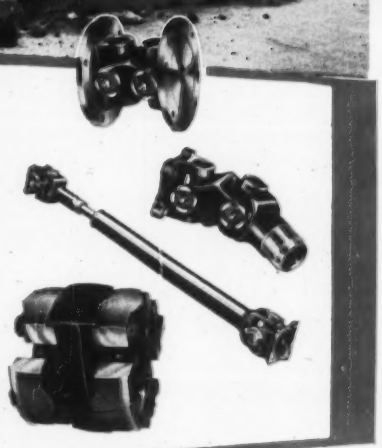
TRACTOMOTIVE

It's a rough, tough, shock-and-strain life for the average 'dozer and loader. But machines like these are ready for it. Part by part, they've had long life engineered right in from the start.

Blood Brothers Universal Joints, for example, are one of the rugged, dependable components you'll find . . . selected for their field-proved ability to withstand punishment.

On these machines—and many other kinds of road-building equipment—Blood Brothers Universal Joints "get the power through" dependably. It's one of their vital functions to help make our highways come sooner.

If you build heavy-duty equipment, write for Bulletin 557—or call on our engineers for suggestions.



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Blood Brothers Machine Division

ALLEGAN, MICHIGAN

UNIVERSAL JOINTS AND DRIVE LINE ASSEMBLIES

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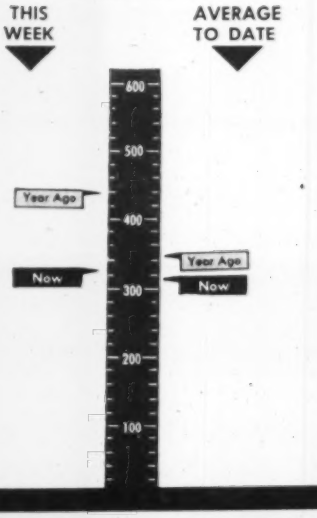
Construction Scoreboard

ACTIVITY THIS WEEK

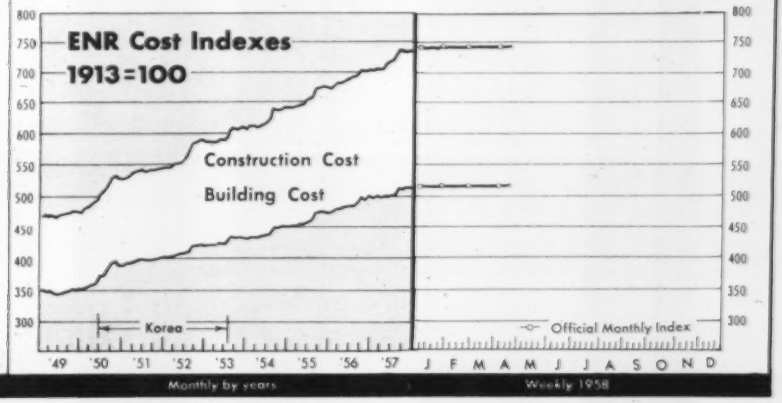
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Apr. 17 1958	% Change from Mar. 13 1958	% Change from Apr. 18 1957
Construction Cost	746.79	+0.3	+5.1
Building Cost	517.76	+0.3	+3.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.680; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.310.



AMOUNT OF CONTRACTS LET

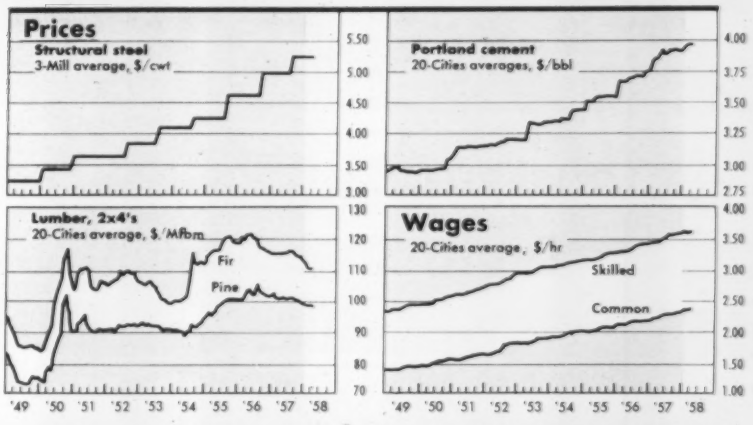
By Ownership	This Week	Cum. 17 wks 1958 millions	Chge '57-'58 %
All Heavy Constr.	$325.7	$5,414.6	−10
Private	113.5	2,565.2	−11
Public	212.2	2,849.4	−9
State & Municipal	166.0	2,243.6	−1
Federal	46.2	605.8	−32
By Type of Work			
Public			
Waterworks	6.7	86.2	−16
Sewerage	14.4	179.7	+32
Bridges*	6.4	149.1	−38
Highways	77.4	886.3	−4
Earthwork, Waterways	26.2	230.4	−34
Buildings, Excl. Housing	35.8	728.8	+0.1
Housing	24.1	340.6	+48
Unclassified	21.2	248.2	−44
Private			
Mass Housing	69.0	1,166.1	+19
Commercial	20.9	598.8	+4
Industrial	13.3	646.1	−43
Unclassified	10.3	154.3	−16

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Apr. 17	Cum. 16 wks 1958 millions	Chge '57-'58 %
Corporate Securities	$247.1	$1,910.7	−9
State and Municipal:			
All Except Housing	80.5	2,160.7	+22
Housing	...	20.3	−51
Federal Loans	1.2	62.2	+13
Federal Aid	...	....	...
Total Nonfederal	$328.8	$4,153.9	+5
Federal Appropriations:			
Projects in U. S.	$83.2	$603.2	...
Outside U. S.	...	....	...
Total New Capital	$412.0	$4,757.1	+20

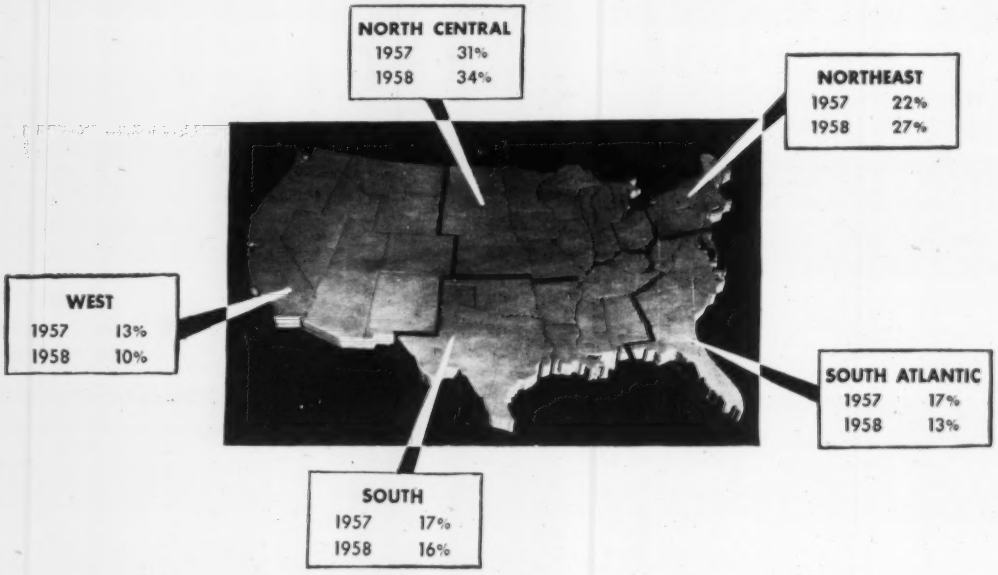


ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost Apr. 1958	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Apr. 1958	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	558	0	+6.7	456	0	+3.1
Baltimore	677	0	+5.3	524	+0.3	+4.9
Birmingham	593	0	+6.8	477	0	+4.3
Boston	764	0	+2.4	522	0	+1.7
Chicago	835	+0.1	+5.8	527	+0.1	+4.4
Cincinnati	745	0	+4.9	501	0	+3.1
Cleveland	847	0	+3.0	512	0	+0.4
Dallas	547	+0.1	+4.3	452	+0.1	+2.9
Denver	725	0	+3.2	524	0	+2.6
Detroit	852	0	+5.3	545	0	+3.4
Kansas City	762	+2.7	+6.9	527	+2.0	+4.9
Los Angeles	773	0	+5.7	507	0	+2.8
Minneapolis	803	0	+5.9	537	0	+2.0
New Orleans	585	−0.5	+4.2	475	−0.6	+3.0
New York	909	−0.1	+6.0	593	−0.1	+2.5
Philadelphia	775	0	+3.4	561	0	+0.8
Pittsburgh	804	0	+5.5	569	0	+5.2
St. Louis	811	−0.3	+6.7	549	−0.4	+3.9
San Francisco	762	+0.6	+5.5	507	+0.9	+4.1
Seattle	785	0	+4.8	466	0	+2.3
U. S.—20 Cities' average	**746**	**+0.2**	**+5.1**	**517**	**+0.1**	**+3.0**
Montreal	584	0	+0.1	446	0	+0.2
Toronto	607	0	+1.1	470	0	+0.8

Capital Spending by Regions—1958 vs 1957

(Percent shares of manufacturers' expenditures)



THE LONGER LOOK:

Two Regions to Get Most of Outlays

The Northeast and North Central states will get a bigger share of the capital investment dollars spent by manufacturing companies in 1958 than they did last year. Smaller shares will go to the South Atlantic, Southern and Western states.

Because of the 18% cut in manufacturers' capital outlays however, every section of the U.S. will see smaller dollar amounts put into new plants and equipment. Only the Northeast—where manufacturing companies plan to invest $2,988 million, against $3,004 million in 1957—will come close to holding its own.

This regional breakdown of the capital spending figures from the new survey of business' plans by the McGraw-Hill Department of Economics (ENR Apr. 17, p. 174) indicates at least a temporary reversal of the postwar trend that had been running in favor of the South and West. But these areas still will be drawing a larger share of manufacturers' outlays than they got in the prewar period.

In 1939, according to the Census of Manufacturers, only 29% of all capital expenditures in manufacturing went to the South Atlantic, South and West. Last year the total for these areas climbed to 47%. This year their share will drop back to 39% of the U.S. total.

One of the main reasons for the shift in emphasis toward the Northeast and North Central areas is tied in with the tapering off of expansion plans. A larger share of manufacturers' capital outlays is going to replacement and modernization—56% in 1958, against 48% last year. And there is much more plant and equipment in need of replacement and modernization in the older industrial areas.

Manufacturers' Capital Spending by Region, 1957 and 1958

(In millions of dollars)

	1957	1958	% Change
Northeast	$3,004	$2,988	− 0.5
North Central	4,297	3,827	−11
South Atlantic	2,319	1,401	−40
South	2,264	1,782	−21
West	1,763	1,131	−36
U. S. Total	13,647	11,129	−18

Plans reported to McGraw-Hill indicate that the Northeast (including Middle Atlantic as well as New England states) will get a bigger share of capital spending in 12 of the 15 manufacturing industries for which figures are available. Only the paper and machinery industries plan to put a smaller share in the Northeast than they did in 1957. Chemical companies plan the same share for this section as last year.

The biggest regional shifts planned are by nonferrous metals companies. One-third of their 1958 spending will go to the Northeast, compared with only 13% in 1957. This gain is offset by smaller shares in the South and South Atlantic regions.

Concentration of spending efforts remains high in some industries. Auto manufacturers will put more than four-fifths of their investment dollars into the North Central region. In the machinery industry, just under 60% is scheduled for the same area. Textile companies report they will spend 60% of their capital outlays in the South Atlantic region.

(B&F continued on page 114)

489,961 FEET OF RAYMOND PILES

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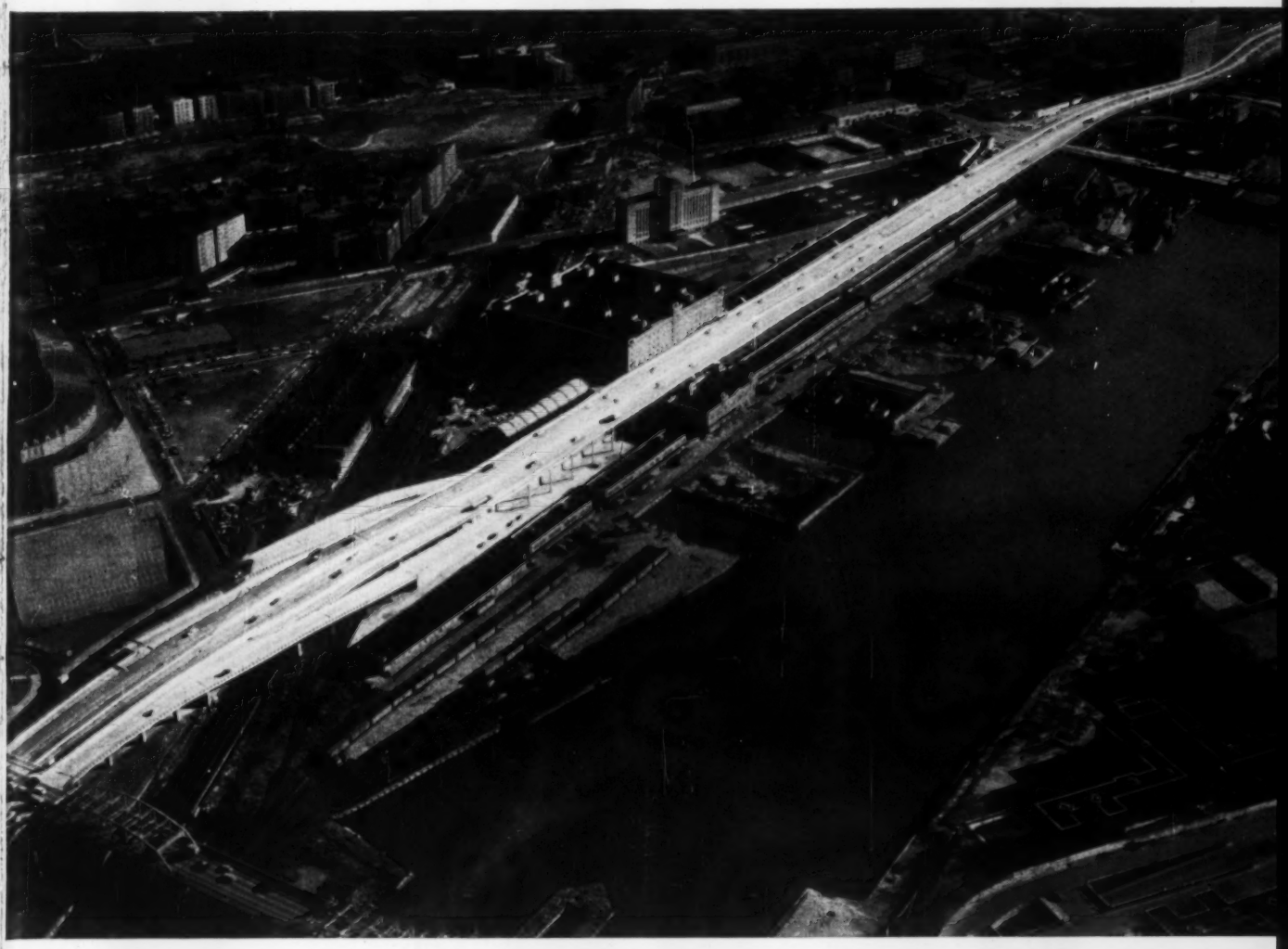

Installing 11,194 Raymond Cast-in-Place Piles for this important artery between Yonkers and Manhattan is just one example of our part in improving motoring facilities from coast to coast. Other projects recently completed include foundations for 93 bridges, overpasses and allied structures for the new Illinois Toll Road System and the 24 mile long Lake Pontchartrain Causeway in New Orleans, Louisiana.

Big jobs? True, but we also take pride in fulfilling small, even one-project contracts as well. So whether you are planning a whole new super highway, a single culvert, bridge, or overpass . . . any highway structure which requires a foundation, investigate the advantages and economy of employing our more than 60 years' experience in the field. Send for our new Highway Brochure which gives a detailed resume of how Raymond can help you and the National Highway Program. Just write Dept. E-7. Or contact your nearest Raymond office and we'll be glad to discuss your foundation projects.

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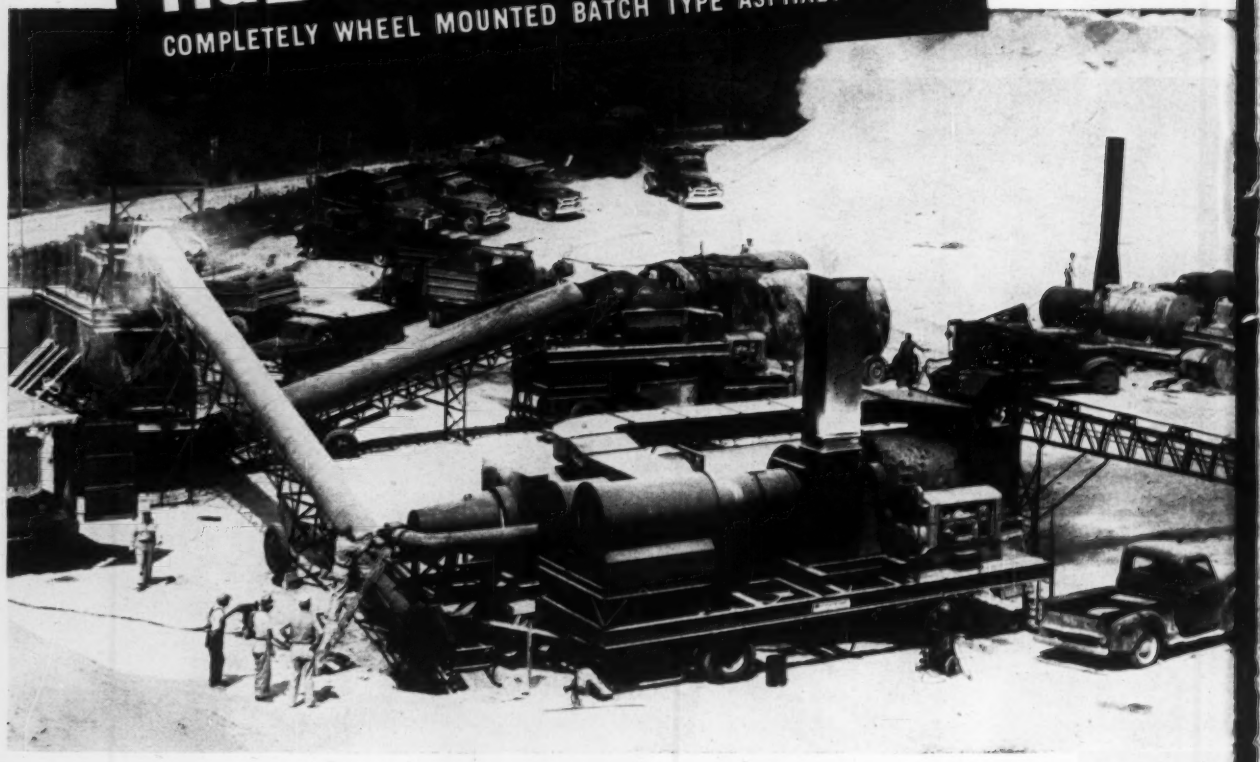
H&B MOBILE 60·40

COMPLETELY WHEEL MOUNTED BATCH TYPE ASPHALT PLANTS



Contractors say: "Increased Production"... "Quicker Moves"..."Lower Costs"..."Will Pay for Itself in Two Years"

These typical expressions of H & B Mobile 40 and Mobile 60 owners tell—more convincingly than any words or claims of ours—what you can expect from one of these completely wheel mounted batch type asphalt plants.

All units of these H & B Mobile plants are self-contained and assembled to the greatest possible degree. Pieces which must come off to meet travel clearances are either light enough to be handled by hand or built-in hoisting means are provided, either as standard or optional equipment. No crane needed for erection or dismantling.

Hinged jack legs or steel stools support all units in operation. No wooden cribbing. All units are completely and permanently wired, and all piping for asphalt, air, heating oil, etc. is permanently mounted on each unit.

The use of conveyors between the various units affords considerable flexibility in plant arrangement. This flexibility of arrangement makes it possible to adapt the plant to special ground or site advantages or limitations.

H & B Mobile Plants are available in three sizes: M-60 (160 to 225 tons per hour), M-40 (120 to 140 tons per hour) and M-20 (40 to 60 tons per hour). Bulletin M-57 will be sent on request.

H&B

"We can move, set up and be running again in 3 *days—instead of a week*" . . .

"We have found that we can reduce our mixing time by 15 seconds per batch, which is a great advantage over the other two plants we operate."

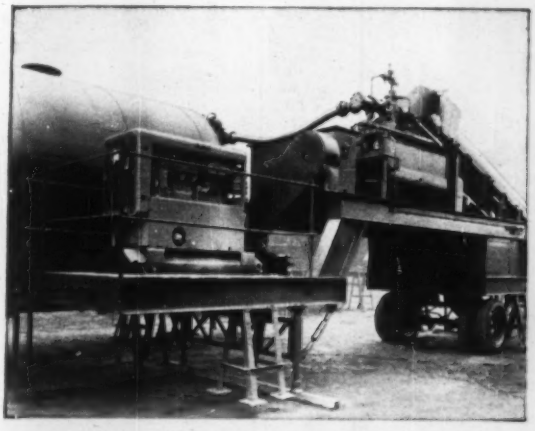
"Time saved in moving, setting up and mixing should pay for this plant in 2 years" . . . P. A. Bradbury Construction Co., Aberdeen, S. D.

"Moving costs reduced by 70%."

"Production increased 70%" . . . Shelly & Sands, Thornville, O.

"We have been most happy with the tremendous output we have been getting from your M-40 plant."

"The production thus far attained has been beyond our fondest expectations, and the manner and ease in which we have been able to dismantle and reassemble has been most amazing." . . . L. M. Pike & Son, Tilton-Laconia, N. H.



Inverted gooseneck trailer design affords maximum clearance under mixer

Insulated portable tank unit in transit

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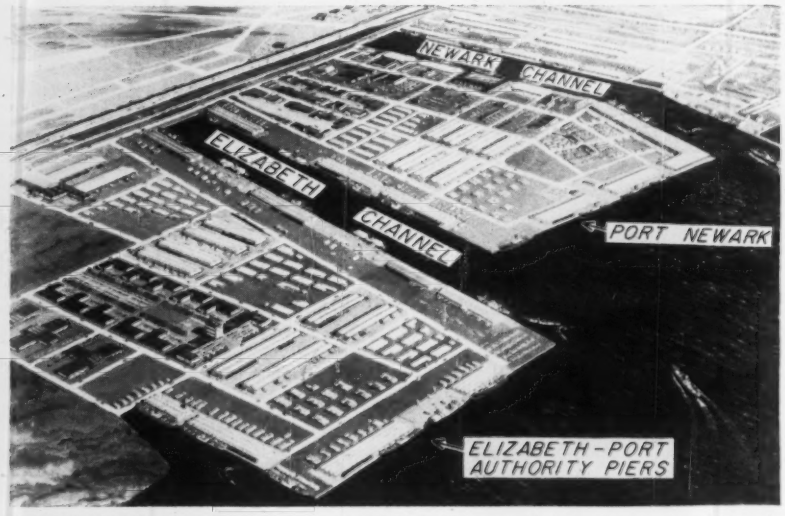

NEWARK-ELIZABETH port area as it will look after completion of expansion program.

Port to Cost $232 Million

To head off increasing competition from other East Coast ports, the Port of New York Authority has blueprinted a $232 million expansion of its facilities in the Newark-Elizabeth, N. J., area. The work will be carried out over 15 to 20 years, Horace K. Corbin, Port Authority commisisoner, said. When completed, it will handle 40% of the cargo entering the port of New York and, counting existing investment, will represent a $275 million expenditure.

Two sites are involved along the shore of Newark Bay. Into the existing Port Newark, the Authority will put $82 million for 11 new vessel berths, three new transit sheds and an additional 3 million sq ft of distribution buildings. Annual cargo capacity will be boosted from 3.5 million tons to approximately 6 million tons.

The second site lies a few thousand feet further south, at the boundary between the cities of Newark and Elizabeth. Here a new channel 600-800 ft wide, 9,000 ft long and 35 ft deep will be gouged out of the present creek running through the marshland. Dredging will be followed by construction of more than 4,000 ft of bulkheading and supporting facilities, at a cost of $13.5 million.

Seven berths will be provided, four of them on the Elizabeth side of the boundary and three along the Newark side.

The Authority has outlined a $150 million "master plan" for the terminal to be developed on the south side of the new Elizabeth Channel. It will cover 703 acres and ultimately have 24 vessel berths backed up by 400 acres of transit open storage area. There will be 5 million sq ft of distribution and handling space. Cargo capacity of the Elizabeth-Port Authority piers will be nearly 5 million tons annually, at least half of which

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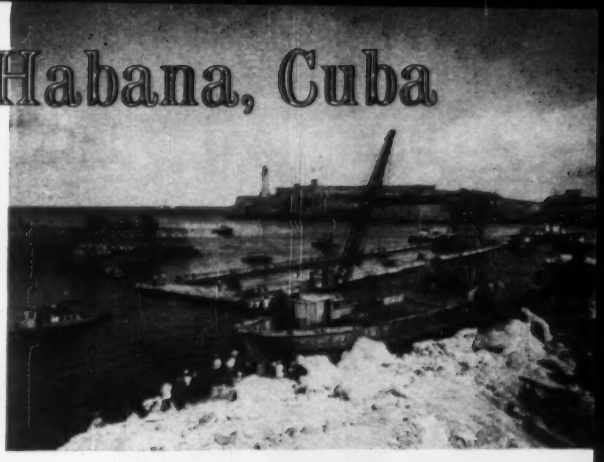
Tunel de la Habana, Habana, Cuba

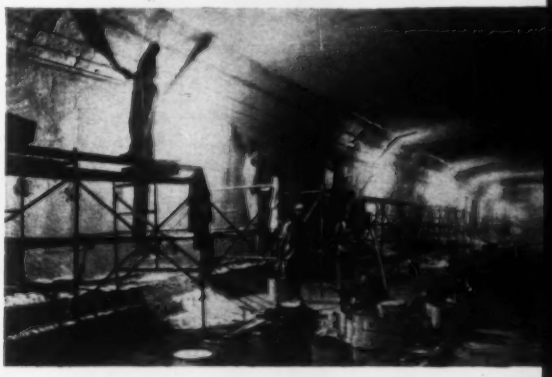
Remarkable engineering accomplishment, protected from water with the **Thoro System Products**

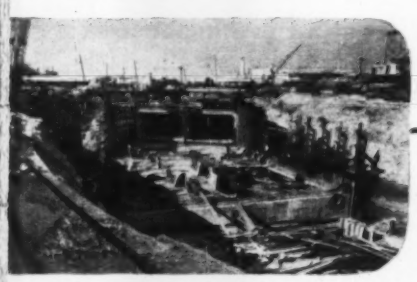


Four-lane, underwater tunnel, connecting Malecon Drive, City of Havana, Cuba with Guanabacoa near the famous Morro Castle, opening the sparsely-populated peninsula to residence and commercial activity.

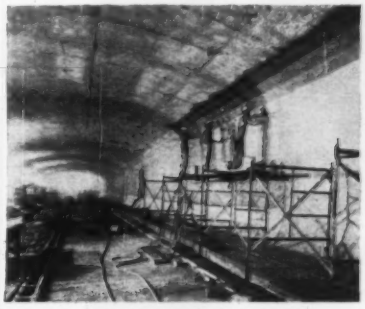
Design, engineering and construction by Societe des Grand Travaux de Marseilles, Paris, France, 733 Meters Long, 23 Meters Wide, 7 Meters High, cost $28,500,000.00. Waterproofed inside and outside with THORO System products, THOROSEAL, WATERPLUG and THORITE.

Mammoth precast concrete sections are floated to location by attached pontoons, lowered 24 meters under water and connected to previously-sunken sections. ***Note the famous Morro Castle. Top, center background.***

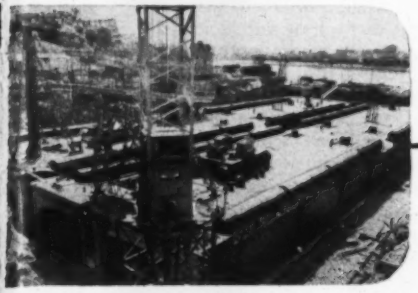




From Havana side, tunnel entrance grades down to harbor pool level.



Two double-lane tunnel sections take shape; forms will be filled with poststressed concrete.



Precast sections of tunnel, honeycomb patched with THORITE Patching Mortar and entire surface protected with THOROSEAL.

Thoro System Products applied, completes the job!

Preparing interior surface for WATERPLUG and one brush and one trowel coat of THOROSEAL. All walls, floors and ceilings are sealed with THOROSEAL.

THOROSEAL is being applied to all interior surfaces. Over 800 drums of WATERPLUG have already been used, where water was entering and where sections were joined together. All honeycomb and construction faults were sealed with THORITE Patching Mortar, before lowered to position in the bay.

Thousands of drums of THOROSEAL, WATERPLUG and THORITE Patching Mortar are being used on this vast project.

Write for literature "HOW TO DO IT"

Standard Dry Wall Products, Inc.
NEW EAGLE, PA. CENTERVILLE, IND.

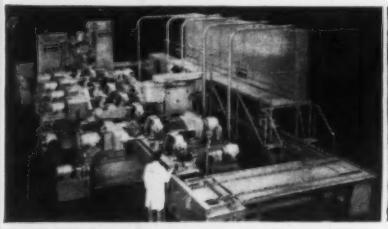
Complicated Concrete Forms Eliminated by WELD-CRETE®

-the amazing liquid bonding agent!

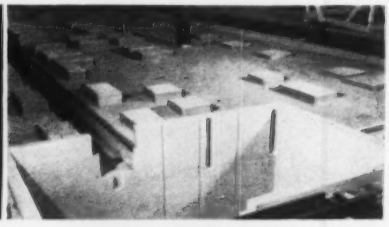
Produces substantial savings for Eaton Manufacturing Company

The Problem: To install two 75-ton 25′ x 67′ milling and drilling machines on concrete floor of Cleveland plant. Machine had to rest on piers rather than floor itself, and forms required for single pour of these mounts were extremely expensive.

Weld-Crete the Answer: Weld-Crete was brushed on 36″ thick base floor at spots where 80 piers were to be located. With the simplest of forms, these 8″ thick piers were later poured with assurance of a permanent bond to the base. The $650,000 machines have operated on these mounts for over a year.



75-ton machine mounted upon 80 concrete piers permanently bonded by Weld-Crete to concrete floor base.



Shows some of 80 piers bonded to concrete base by Weld-Crete. Simple bonding replaced complicated forming, resulted in appreciable savings in installation of 75-ton machines shown above.

Whether you're installing new equipment, moving old, or repairing floors . . . Weld-Crete enables you to *permanently* bond new concrete *directly* to old . . . or *any* sound surface. No costly, time-taking chipping, drilling, roughening, acid washing or scarifying of concrete base. When used with quick setting cement topping, you can lay new floors, ramps, driveways, etc., and run heavy truck traffic over them the next day. The insurance of a permanent bond with Weld-Crete costs as little as 4c per square foot! Get fact-packed literature about Weld-Crete from your Weld-Crete dealer, see Sweet's File, or write us direct.

LARSEN PRODUCTS CORPORATION
Box 57561 Bethesda, Md.

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will be handled at container-ship berths. Fourteen conventional shedded berths and five open berths also are planned.

The first stage of the work will begin in June when Atlantic, Gulf and Pacific Co. of New York, holder of a $4.8 million dredging contract, starts carving out Elizabeth Channel. Some 14 million cu yd of earth will be removed for the new channel.

The contract also covers two other dredging jobs. The present channel along Newark Bay in front of the Norton, Lilly Terminal will be extended 1,060 ft south to meet Elizabeth Channel. In addition, an 1,850 ft north-south channel will be dredged along the Newark Bay side of the new Elizabeth terminal.

Dredging and construction of bulkheading and berths will be finished in 1961 at a total cost of $18.3 million, the Authority estimated. A $10 million labor payroll is expected over the next three years.

Ferguson Sues

Cleveland contractor asks $2.4 million of Chrysler

H. K. Ferguson Co., Cleveland contracting firm, has filed suit against Chrysler Corp., Detroit, for $2.4 million, charging that the auto maker failed to meet all the conditions of a contract under which Ferguson built a stamping plant at Twinsburg, Ohio, in 1956.

In the petition filed in the U. S. District Court at Cleveland, Chrysler is stated to have paid Ferguson $3.2 million, the amount anticipated in the original contract. The additional $2.5 million is claimed because of the following alleged contract violations:

- Chrysler was to have provided a perimeter drainage system to divert all water from outside the area of operations. Chrysler did not do this, and lack of the drainage during a rainy summer hampered the contractor and increased his costs.
- Chrysler required Ferguson to work under weather and site conditions that made it impossible to follow the basic construction plan, the petition asserts.
- Chrysler, it is charged, permitted other contractors under its control to deviate from grade depths originally set and refused to correct the situation, adding to construction difficulties.
- Costs also were increased through lost work time when Chrysler failed to deal with jurisdictional disputes that arose during construction, the petition alleges. The unions involved did not represent any Ferguson employees. Also, the auto company did not give

the contractor advance notice of the issues in dispute. William D. Ginn, Ferguson's attorney, gave as examples a strike involving Pennsylvania Railroad maintenance employees that lasted from August 8 to 26 and another that lasted from September 21 to 30 and concerned workers of Hunkin-Conkey Construction Co., Cleveland. There were other, briefer stoppages, Mr. Ginn added.

• Chrysler forced the contractor to use a more expensive type of concrete for footers than was originally specified, and required more expensive ways of constructing certain types of concrete piers, the petition asserts.

The Ferguson firm was on the job from February to December 1956. Its contract called for excavation, grading, foundation, track and electrical work, and construction of a boilerhouse—all of which work was accepted by the Chrysler Corp., according to the petition.

Law Found to Threaten County Bonding Power

Unforeseen consequences of a new state law may impair the bond-issuing authority of Ohio's county governments and will definitely delay $5 million in sewer improvements in at least two counties. The law, passed in the last session of the state legislature, forbids the prior practice of retiring bonds issued for improvements by assessing benefited property owners on a foot-frontage basis. The new law requires that half a project's cost be guaranteed by utility taxes collected from immediate users rather than obtained through assessments on land (ENR Apr. 3, p. 113).

Because of this stipulation, Henry J. Crawford, of the Cleveland law firm, Squire, Sanders & Dempsey, said his firm wouldn't approve issuance of revenue bonds of Cuyahoga County unless 50% of the debt service cost could be met by sewer rental charges. This hits at four projects in the Cleveland area: a $700,000 sanitary sewer job in portions of South Euclid, Lyndhurst, Beachwood and Mayfield Heights; a $750,000 sewage plant intended to serve most of Brecksville and a new Veterans Administration hospital; a $2 million sewage plant in Solon; and a $75,000 trunk sewer to serve Hillcrest Hospital. In Akron, $1.5 million in projects will be delayed.

Though the county's sanitary engineer, John H. Puzenski, said he believes the new law conflicts with other sections of the state code, he admitted the projects will be held at the planning stage until a court test of the law.

Tectum roof decks

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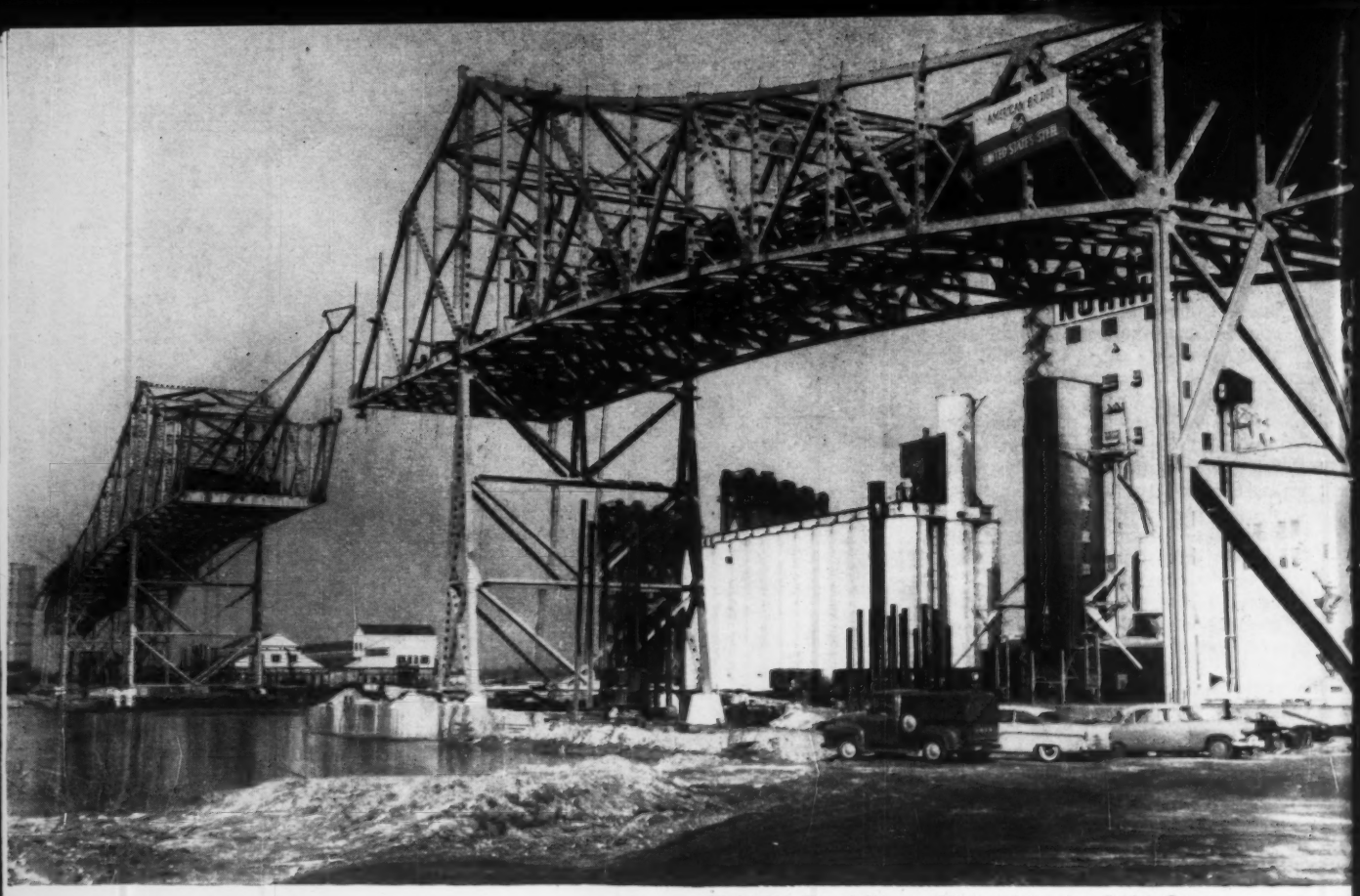

Contractor: City of Chicago, Illinois and American Bridge. **Owner:** City of Chicago, Illinois. **Designs by:** J. E. Greiner Company, Baltimore (Section Engineers) and DeLeuw, Cather & Company, Chicago (Coordinating Engineers).

Calumet Skyway Toll Bridge

new link in Chicago's Expanding Expressway Program

This important new bridge, fabricated and erected by American Bridge, carries Skyway traffic across the Calumet River in Chicago, Illinois. It represents another step forward in Chicago's dynamic program of public improvements. The new six-lane toll bridge is 2,467 feet long and has a 125-foot vertical clearance above water at the center of the main span.

For the erection of this bridge, American Bridge fabricated and erected 8,673 tons of structural steel. This total included 977 tons of USS MAN-TEN High Strength Steel and 2,649 tons of USS COR-TEN High Strength Low Alloy Steel. American Bridge also supplied 912 tons of reinforcing steel, 3,872 lineal feet of wrought-iron and cast-iron drain pipe, plus flooring, railing and other auxiliary items. American Bridge fabricated and erected an additional 13,517 tons of structural steel on other sections of this important new traffic artery.

American Bridge has the experience, manpower and facilities to handle vital jobs like this as part of every-day operations. Put our "know-how" to work on your next project.

USS, Man-Ten and Cor-Ten are registered trademarks

CONSTRUCTION DETAILS:

Spans: One 1,300-foot thru cantilever truss composed of one 650-foot center span and two 325-foot anchor spans. Three 208-foot truss spans. Three 178-foot deck truss spans.

Supports: Four steel towers. Six steel bents.

Roadways: Two 36 feet wide. One 4-foot-wide median strip.

Trusses: 95 feet deep at main tower. 50 feet deep at center of main span. 32 feet 4 inches deep at shore ends of anchor spans. 28 feet deep at approach deck spans. 87 feet center to center of cantilever trusses.

Field connection: Riveted.

American Bridge
Division of USS United States Steel

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Orange, Texas · Philadelphia · Pittsburgh · Portland, Ore. · Roanoke · St. Louis · San Francisco · Trenton · United States Steel Export Company, New York

A Day's Work for a Day's Pay

A code of work practices aimed at lower building costs has been tossed into Cleveland bargaining

Construction employers in the Cleveland, Ohio, area are attempting to sell a nine-point cost reduction program to the unions whose members they employ.

The code, designed to increase labor productivity and to lower building costs, was drawn up by the Cleveland Building Trades Employer's Association, which is now in collective bargaining negotiations with the unions. The BTEA has refused to consider a wage increase "until satisfactory agreements" on the points contained in the code have been reached with the unions.

Key to current negotiations is a "full day's work for a full day's pay"—a goal which the cost reduction program seeks to achieve by effecting what the BTEA calls "a return to sensible working practices."

Somewhat similar in content but more limited in scope than the code of work practices adopted earlier this year by the general presidents of the AFL-CIO; international building trades unions (ENR Feb. 13, p. 41), the nine-point program calls for:

• **Elimination of show-up time because of weather conditions.** Members of some unions now get up to two hours pay when they show up for work and are sent home because of the weather. The BTEA is willing to make reasonable concessions where work is not available because of human error but believes contractors should not be compelled "to assume complete responsibility for the weather."

• **Full day's work.** Workers must be at work at 8:00 and remain until 4:30 with a half hour (from 12:00 to 12:30) of one-half hour's pay.

• **No coffee breaks.** Coffee breaks during working hours shall be prohibited. Penalty for each violation: loss of one-hour's pay.

• **No restriction on amount of work.** Amount of work a man can perform in any period must not be restricted.

• **No feather-bedding.** All feather-bedding practices and all restrictions against use of machinery, tools or other labor-saving devices shall be prohibited. (The BTEA suggests that a joint board, representing the BTEA and the unions, be established to "investigate and determine corrective action.")

• **Payroll payments by check.** Employers may, at their option, pay workers by check if the latter are guaranteed by a recognized trade association or an individual bond.

• **Exemption of foremen from union contract.** Foremen are classified as supervisors and shall not be required to hold union membership and shall not be represented in wage negotiations.

• **Work by stewards.** Stewards shall be required to perform work and may be discharged by the employer for inefficiency.

• **Elimination of travel time.** Workers shall not be entitled to travel time on jobs in the area covered by a union's labor contract.

The nine-point program was submitted by the BTEA to the Cleveland Building and Construction Trades Council.

It was made clear by the association that there is no single craft to which all nine points are applicable. But it says the boom years since the war have encouraged a trend among many workers to perform less than a full day's work, and the welfare of the industry now depends "to an important extent on how effectively this trend is reversed."

In presenting the program, BTEA Vice President William J. Hunkin commented: "Adoption of these points should bring an increase in productivity and a reduction of non-essential costs without working any hardship on anyone."

Aid to Unemployed

Use of federal grants is proposed as AFL-CIO asks Congress for fast action

Democratic members of Congress came up with a new proposal for federal assistance to the unemployed last week as the AFL-CIO urged that "first priority" be given to improvements in unemployment compensation benefits.

Drafted by members of the House Ways and Means Committee, the plan would authorize use of federal funds to extend jobless insurance benefits for a period of 16 weeks beyond the payment periods now authorized by various state laws.

Earlier in the week, AFL-CIO President George Meany sent identical letters to all members of Congress warning that America "stands on the brink of depression" and calling for "swift and meaningful action."

In urging that the jobless insurance issue be given priority over all other anti-recession measures, Mr. Meany said that "substantial increases in unemployment compensation payments will not only help the recipients but will increase general purchasing power which will in turn help the entire economy."

The Democratic proposal would not increase the size of state payments, which now range from $25 to $45 a week, but would give jobless benefits to those not eligible for benefits under present laws. It would cost the federal government an estimated $1 billion. Funds so used by the states would be outright grants.

The proposal is a rejection of the Administration recommendation that state benefit periods be increased by 50% through funds loaned to the states by the federal government. Temporary in nature, it also falls short of the AFL-CIO request that Congress, through new federal standards, force the states to improve both the size and duration of their benefits on a permanent basis.

Say "No" to Merger

AFL building trades cite problems on jurisdiction

Industrial union use of labor contract clauses that deprive contractors and building tradesmen of in-plant construction work threatens to torpedo an AFL-CIO merger at the local level in Toledo, Ohio, next week.

Pending merger is between the Toledo Industrial Union Council (CIO) and the Central Labor Union (AFL).

Local building trades unions have taken the position that there is no point in discussing "any kind of merger" until "basic differences" between craft and industrial unions have been resolved. The differences are jurisdictional and, in the final analysis, relate to job opportunities.

The conflict has plagued the AFL-CIO since its founding and has been a significant factor in preventing achievement of labor unity at state and local levels. Complaint of the building trades is that industrial unions, by claiming the right to perform in-plant construction work, are invading the jurisdiction of craft unions and destroying the concept of construcion

by contract. In recent months, various contractor groups have begun to share the union concern.

The Toledo group has accused industrial unions of putting restrictive clauses in their labor contracts. One of the offenders specifically mentioned is the United Auto Workers union.

"Until industrial unions agree to cancel from present contracts and refrain from negotiating into future contracts the restrictive clauses that compel management to give production workers the prime rights of performing building trades work in their plants," said a spokesman for the Toledo Building Trades Council, "there is little point in discussing merger terms."

A CIO spokesman in Toledo says there has been no serious jurisdictional dispute with the craft unions in the Toledo area for the past decade. Richard Gosser, regional vice president of the UAW, has told the building trades unions he is "ready to guarantee them that there is no desire on our part to take even half a job away from them when we merge."

Merger committees of the AFL and CIO groups are scheduled to resume their merger talks on Monday. Present plan appears to be to go ahead with the merger negotiations without the building trades' support. This was recently done at the state level in Michigan.

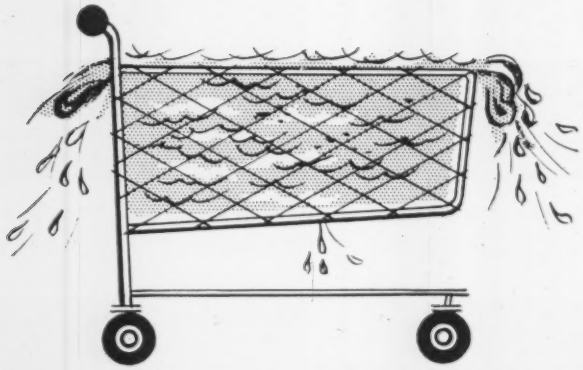
Work Assignments

Jurisdictional strike is viewed as a violation of bargaining rights

A National Labor Relations Board trial examiner has ruled that neither a decision of the National Joint Board for the Settlement of Jurisdictional Disputes nor a jurisdictional agreement between international unions can be used to upset a collective bargaining relationship existing under an NLRB certification.

The ruling stemmed from a jurisdictional dispute in Alaska between a carpenters and a painters local union over installation of Marlite and acoustical tile. The painters local was certified as collective bargaining representative for Fuller Paint and Glass Co. employees "engaged in the installation" of acoustical tile, Marlite and similar products. When Fuller assigned the disputed work to painters, the carpenters protested and struck.

An injunction against the strike was obtained in federal court. Meanwhile, the dispute was referred by the unions to the National Joint Board which rendered a decision in favor of the car-



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penters. (Fuller was not a party to the Joint Board proceeding.) A compromise agreement also was reached by the disputing unions calling for a division of the work.

The trial examiner viewed the carpenters' effort to get the work as an attempt to force Fuller to recognize the carpenters union as collective bargaining agent rather than the painters. Under provisions of the Taft-Hartley Act, this is an unfair labor practice and is prohibited.

What the certification means, the examiner said, is that the painters union "is the bargaining representative of Fuller employees." When an employer decides to give certain work to a certain class of employees, he explained, "and the union is certified as the representative of such employees in an appropriate unit, the union is thereby protected from encroachment by another organization."

In disposing of the Joint Board decision and the union agreement, the examiner ruled that the NLRB certification could not be upset by the board decision, particularly since Fuller was not bound by the decision and that the union agreement "can hardly be considered as relinquishment of the certification."

Teamsters Union Scores Big Gain in Membership

James Hoffa, President of the International Brotherhood of Teamsters, reports that the union's membership has increased by nearly 19,000 since a year ago despite mounting unemployment and "vicious attempts" to destroy the union.

Mr. Hoffa's figure is based on a total membership figure as reflected by the per capita tax that is paid by affiliates. The February total, he revealed, was 1,552,001.

According to Mr. Hoffa, the union will continue to give top priority to organization of the unorganized "in cooperation with those of our fellow unionists who care to join."

Mutual assistance pacts, Mr. Hoffa said, have been reaffirmed with several unions, including three in the building trades (carpenters, operating engineers and laborers) and should "prove to be of advantage in expanding membership in the teamsters."

Mr. Hoffa's union was expelled from the AFL-CIO last year and is no longer an affiliate of the AFL-CIO Building and Construction Trades Department. Up to the present time, these changes have had no significant effect on labor-management relations in the construction industry.

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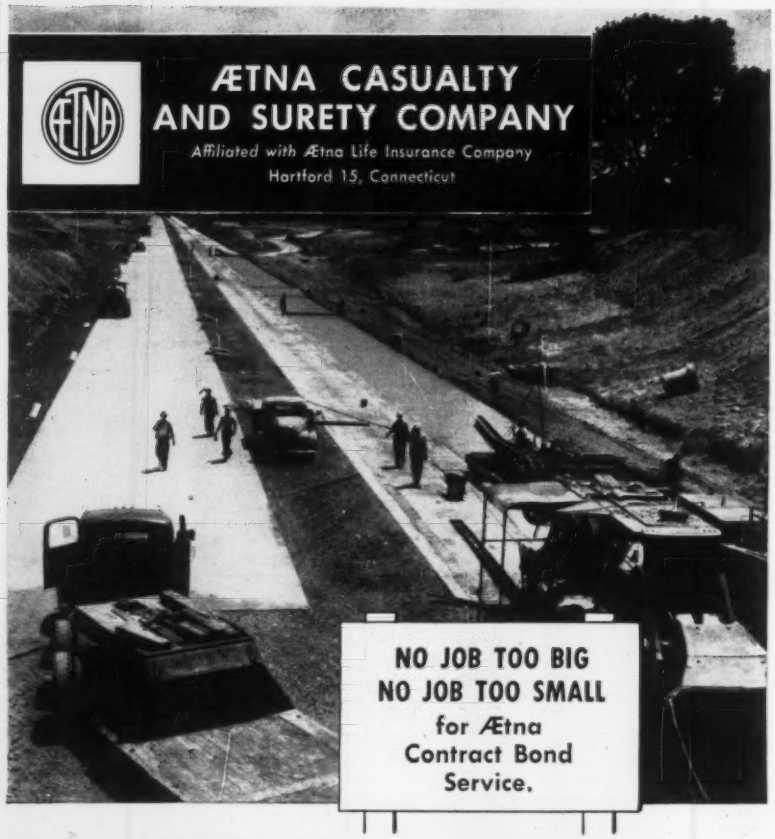

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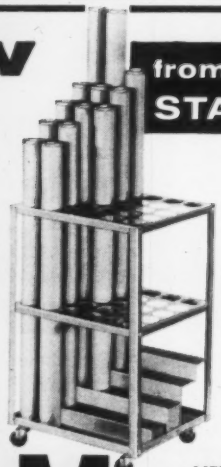

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OFFICIAL PROPOSALS

Bids: May 6, 1958

Power Authority of the State of New York

for Construction of
Massena Town Beach and Barnhart Island Bathhouses,
Information Center,
Long Sault, Barnhart and Hawkin's Point Overlooks near Massena
St. Lawrence County, New York
Specifications No. PA-5-11039
St. Lawrence Contract No. SP3

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Massena Town Beach and Barnhart Island Bathhouses, Information Center, and Long Sault, Barnhart and Hawkin's Point Overlooks, near Massena, St. Lawrence County, New York until 2:30 P.M., Eastern Daylight Saving Time on the 6th day of May at the Coliseum Tower, 18th floor, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

The principal work consists of the construction of beach structures consisting of bathhouse and refreshment stand at Massena Town Beach and Barnhart Island Bathhouse structures, an information building at the entrance of the St. Lawrence Project and Long Sault, Barnhart and Hawkin's Point Overlook structures.

All work shall be completed on or before December 31, 1958.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the Coliseum Tower, 18th floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Twenty-five ($25.00) dollars per initial set and Ten ($10.00) dollars per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office, and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

Prequalification Date: May 1, 1958

Board of Education Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:

General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures for the new Public School 198, Manhattan. East 96th Street, Lexington and Third Aves. Junior High School 51, Richmond. Houston Street and Willowbrook Road, Graniteville.

Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.

Bids when advertised, will be received from prequalified bidders only.

Time for submitting prequalification applications by contractors will expire on Thursday, May 1, 1958.

WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: April 10, 1958

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: May 20, 1958.

Contract NA-220.014

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
EXTENSION OF TAXIWAY N
PAVING AND UTILITIES

Sealed proposals for the construction of paving and utilities for the extension of Taxiway N at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, May 20, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, April 24, 1958

Bids: May 20, 1958.

Contract BP-170.001

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
NEW PIER 3
DEMOLITION, DREDGING AND DECK CONSTRUCTION

Sealed proposals for the demolition and removal of existing Piers 10, 11 and 12 and the storage sheds thereon, the construction of the substructure and deck for New Pier 3 and dredging at and about the site of New Pier 3 at the Brooklyn Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, May 20, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

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THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, April 24, 1958

Bids: May 14, 1958.

City of Fort Lauderdale, Florida

Sealed bids or proposals, addressed to City of Fort Lauderdale, Florida, and marked Project No. 628 "East Sunrise Boulevard Bridge over Intracoastal Waterway" will be received at the office of the City Commission of Fort Lauderdale, City Hall, Fort Lauderdale, Florida, until 11:00 A.M. E.S.T., May 14, 1958, and at 11:00 A.M. E.S.T. on said date they will be publicly opened and read aloud.

The project consists of the construction of a double leaf rolling lift bascule span with all its appurtenances, steel and prestressed concrete approach spans and abutments. It also includes certain modifications to an existing parallel structure.

Instructions to Bidders, Proposal, Form of Agreement, Form of Construction Bond, Specifications, and the Plans may be examined at the office of the City Engineer, City Hall Annex, City of Fort Lauderdale, Florida, on and after 9:00 A.M., April 7, 1958, or copies of same may be obtained there.

Plans and specifications may also be examined at the offices of J. E. Greiner Company, 1106 N. Charles Street, Baltimore, Maryland and J. E. Greiner Company, Inc., 207 North Franklin Street, Tampa, Florida.

A deposit of $25.00 will be required for each copy of the Contract Documents which deposit will be refunded, to bidders, upon return of the Documents in good condition, within ten days after the opening of bids.

A certified check or cashier's check in the amount of 2% of the total amount of the bid, made payable to City of Fort Lauderdale, Florida, or a bid bond in the said amount written by a qualified Corporate Surety company, executed and issued by a Resident Agent licensed by and having office in the City of Fort Lauderdale, Florida, representing such Corporate Surety, shall accompany each proposal as evidence of the good faith and responsibility of the bidder. This check or bond shall be retained by the payee as liquidated damages should the bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the proposal, in the event the proposal of the bidder is accepted.

Public Liability and Property Damage Insurance and Construction Bond will be required.

The City Commission reserves the right to waive any informalities in or reject any or all bids and to accept the bid most favorable in the interest of the City, after all bids have been examined and canvassed.

W. J. Veeder
April 4, 1958 City Manager

Bids: May 29, 1958

Invitation for Bids

The City of Anchorage invites bids for the construction of a 630 ft. dock and port facility, consisting of a concrete deck on steel piling, railroad trestle and highway approaches, dredging, and two 40-ton and two 5-ton level-luffing cranes, at Anchorage, Alaska. Bids will be received by the City Manager until 2:00 p.m. Alaska Standard Time, May 29, 1958, at which time bids will be publicly opened.

Plans, specifications, and bid documents will be obtainable on or after April 18, 1958 at the office of the City Purchasing Agent, First Avenue and Post Road, (mailing address Box 400), Anchorage, Alaska, or at the engineering office of Tippetts-Abbett-McCarthy-Stratton, 62 West 47th Street, New York 36, New York. A deposit of $50.00 will be required for documents, of which $25.00 will be refunded provided documents are returned in good condition prior to July 1, 1958.

The City reserves the right to reject any or all bids, and to waive informalities in the bids.

CITY OF ANCHORAGE
By George C. Shannon
City Manager

Bids: May 27, 1958

Erie County Water Authority

Notice is hereby given that sealed bids will be received in accordance with the law by the Erie County Water Authority until two o'clock P.M. Eastern Daylight Saving Time on the twenty-seventh day of May, 1958 at the office of the Authority, 338 Ellicott Square Building, Buffalo 3, New York, and will then be publicly opened and read.

The work to be done comprises furnishing all materials and labor, tools, plant and equipment necessary for constructing, installing and completing, ready for operation, the Sturgeon Point Filtration Plant, a rapid sand, gravity type water filtration plant with its low lift pumping station, having an initial capacity of sixteen (16) million gallons per day.

Copies of the plans and specifications may be examined without charge at the office of the Erie County Water Authority or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York. Copies thereof may be obtained at either office upon deposit of One Hundred and Fifty ($150.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within thirty (30) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed is divided into two (2) sections under which the work is classified according to its character. The principal items of work are as follows:

SECTION F—BUILDINGS AND STRUCTURES. Constructing the filtration plant and low lift pumping station structures complete including aerator, mixing basins, settling basins, filters, control and filter building, filtered water basin, washwater storage tank, decanting basin, sewage disposal system, piping around the plant, roadways, walkways, grading and other miscellaneous structures and appurtenances, including all plumbing, heating and electrical work.

SECTION G—FILTER, CHEMICAL AND PUMPING EQUIPMENT. Furnishing and installing the mixing equipment and piping; the flocculating equipment and piping; the filter piping, valves, controllers, sand and gravel, operating tables and other equipment; the chemical feed equipment and piping; the raw water, treated water and wash water pumping equipment and piping and all other special apparatus necessary to treat and pump the water.

Bidders will be allowed to bid on one (1) or both sections.

Each proposal must be accompanied by a certified check payable to the Erie County Water Authority or a bid bond to the favor of the Authority from a reliable surety company authorized to do business in the State of New York and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified check will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for forty-five (45) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

The Authority has submitted applications for permits to construct the project to various Federal and State Authorities having jurisdiction and Contracts will not be executed by the Authority until these permits are issued.

ERIE COUNTY WATER AUTHORITY
By: WILLIAM J. CARNEY
Secretary

Buck, Seifert and Jost
Consulting Engineers
Dated: April 17, 1958

OFFICIAL PROPOSALS

Bids: May 1, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 1st day of May 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

DISTRICT No. 3, E. E. Towlson, Acting District Engineer, 333 E. Washington Street, Syracuse, New York

County	Contract No.	Name
Oswego	FISH 58-9	Interstate Route 505 (Brewerton-Central Square) Oneida Lake Bridge Project I-1118(9)

Miles	Type	Deposit	Estimated Cost of Work
0.32	Asphalt Concrete, Ty. 1A=0.32 Mi. Including Oneida Lake Bridge 2 Prestressed Concrete Superstructures (Continuous) Each Superstructure— 3 Spans—320', 70', 70'	$119,000 Plans $10	$2,160,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: June 15, 1958.

Power Authority of the State of New York

ADVANCE NOTICE
CHANNEL IMPROVEMENT FOR BARNHART ISLAND POWER PLANT TAILRACE
SPECIFICATIONS NO. PA-5-1103
ST. LAWRENCE CONTRACT NO. 47

The Power Authority of the State of New York will advertise for bids and will have plans, specifications, and proposal forms available for issuance to prospective bidders on or about May 15, 1958, for Channel Improvement for Barnhart Island Power Plant Tailrace, St. Lawrence Contract No. 47. Bids on this contract will be opened on or about June 15, 1958.

The work will consist principally of the excavation of approximately 3,000,000 cubic yards of material in an area of the St. Lawrence River channel approximately 1,300 feet wide by 3,000 feet long. The upstream end of the proposed channel excavation to be included in Contract No. 47 will be approximately 1,500 feet downstream from Barnhart Island Power Plant and the northern limit of excavation will be approximately along the International Boundary, near the center of the river channel. The disposal area for the excavated material will be on the American mainland adjacent to the excavation area. Construction and removal of a perimeter cofferdam to enclose the area to be excavated so that excavation can be performed with land-based equipment will be included in the contract.

The tentative completion date for the date for the excavation and for the major portion of the cofferdam removal is December 31, 1959.

Following issuance of the plans, specifications, and proposal forms, copies thereof may be obtained from the Power Authority of the State of New York upon application and payment of a fee in an amount to be stated in the advertisement to be issued for this work, and will be available for inspection by prospective bidders in the Authority's office, 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, N. Y., in the offices of the Engineer, Uhl, Hall and Rich, 230 Congress Street, Boston 10, Mass., and in the offices of the Hydro Electric Power Commission of Ontario, 620 University Ave., Toronto 2, Ontario.

Prospective bidders on the work described in this advance notice may obtain a drawing showing underwater topography of the river channel and topography of the adjacent mainland from the field office of the Engineer, Uhl, Hall and Rich, P. O. Box 68, Massena, N. Y., upon application and payment of $1.00 per print. No information on the proposed channel improvement work except the topographic drawing and the information given in this notice will be furnished to prospective bidders in advance of the issuance of the specifications.

The information contained in this Advance Notice is subject to change without notice. This Advance Notice and the drawing mentioned above are not to be considered as constituting parts of the contract documents for St. Lawrence Contract No. 47.

W. S. CHAPIN
GENERAL MANAGER

Bids: May 14, 1958

Construction of Sewage Treatment Plant

Sealed proposals will be received by Mr. Paul Chalfont, c/o Christiana Machinery Company, Christiana, Lancaster County, Pennsylvania, for the undersigned, until 6:00 P.M. Eastern Daylight Saving Time, Wednesday, May 14, 1958; and from 6:00 P.M. until 8:00 P.M. of the same day they will be received at the Meeting Room of the Christiana Borough Council on the second floor of the Masonic Hall in Christiana, Pennsylvania, at which place shortly after 8:00 P.M. of the same day mentioned above, they will be publicly opened and read.

Proposals shall cover furnishing all necessary labor, materials, and equipment, and performing all work for the Contracts noted below. Separate proposals will be received upon four (4) parts of the project as hereinafter indicated. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten percent of the bid total, all in accordance with the provisions contained in the Contract Documents.

Copies of the Contract Documents, including Drawings and Specifications will be on file, for inspection purposes only, at the Christiana Machinery Company, c/o Mr. Paul Chalfont, Christiana, Pennsylvania; they may also be seen at the office of Gannett Fleming Corddry and Carpenter, Harrisburg, Pennsylvania, from whom only they may be obtained, not to exceed two (2) sets of any particular Contract to a prospective bidder, upon deposit of the following indicated amounts for each set:

Contract One—CONSTRUCTION OF A SEWAGE TREATMENT PLANT $30.00
Contract Two—PLUMBING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT $20.00
Contract Three—HEATING WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT $20.00
Contract Four—ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF A SEWAGE TREATMENT PLANT $20.00

Full refund will be made (only to actual bidders on the four (4) prime Contracts noted above) for return of one (1) set, no more, of a particular Contract in good condition within fifteen (15) calendar days after closing date for receipt of bids; refund for return of all other sets in good condition within the same period, will be fifty (50) percent of deposit. No refund of deposit will be made for Contract Documents returned later than fifteen (15) calendar days after date of receipt of bids.

CHRISTIANA BOROUGH AUTHORITY
Christiana
Lancaster County
Pennsylvania
Gannett Fleming Corddry & Carpenter, Inc.
Engineers
600 North Second Street
Harrisburg, Pennsylvania

Bids: May 2, 1958

New York State Bridge Authority

NOTICE TO BIDDERS
Poughkeepsie, New York

Sealed proposals will be received by the New York State Bridge Authority at its office at Mid-Hudson Bridge Plaza, Poughkeepsie, until 2:00 P.M. Eastern Daylight Saving Time on the 2nd day of May, 1958, at which time and place they will be publicly opened and read, for the furnishing of the labor and materials necessary for the complete cleaning and repainting of the Rip Van Winkle Bridge spanning the Hudson River at Catskill, New York.

Plans, specifications, proposal blanks, form of contract, bond and information for bidders may be seen at the office of the New York State Bridge Authority, Mid-Hudson Bridge Plaza, Poughkeepsie, New York; at the offices of Modjeski and Masters, Consulting Engineers, Sixth Street at Forster, Harrisburg, Pennsylvania, and copies of the same may be obtained therefrom upon a deposit of Fifteen Dollars ($15.00), which sum will be refunded if the plans and specifications are returned by bidders in good condition within twenty (20) days of bids having been received and acted upon by the New York State Bridge Authority, and Ten Dollars ($10.00) will be so returned to non-bidders.

A certified check on a National Bank, State Bank or Trust Company in the sum of ten per cent (10%) of the amount of the bid, made payable to the New York State Bridge Authority must accompany the bid, as a guarantee that the contract will be entered into, if awarded.

A faithful performance bond in the sum of one hundred per cent (100%) of the contract price will be required.

A labor and material bond will also be required.

The New York State Bridge Authority reserves the right to reject any or all bids.

JOHN S. STILLMAN
Chairman

Bids: May 27, 1958

Contract NA-410.001

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
FIRE PUMPING STATION MODIFICATION
AND
TANK FOR SECOND WATER SUPPLY

Sealed proposals for the construction of a water tank and the furnishing and installation of a pump in the Fire Pumping Station at Newark Airport, N. J., together with modification of piping and controls therefor will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N.Y., until 2:30 P.M. on Tuesday, May 27, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, April 24, 1958

OFFICIAL PROPOSALS

Bids: May 15, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS. AL-

OFFICIAL PROPOSALS

BANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty

OFFICIAL PROPOSALS

o'clock A.M., eastern standard time, on the 15th day of May 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, New York						
Albany	FISH 58-3	Interstate Route 502, Sect. 2, Cont. 1 (Latham to Mohawk River) Project I-1119(16)	3.04 (3.70 Acc.)	9" Cement Concrete Pavt. = 2.90 Mile; Asphalt Concrete = 0.11 Mile; Misc. Work = 0.03 Mi. including 4 Hwy. Gr. Sep.-Comp. Beams 234.5', 231', 131.5', 135.5' Pier Footings for Future H.G.S.	$230,000 Plans $10	$4,199,000
Essex (Rtes. 8, 9N, 22)	RC 58-36	Ticonderoga-Crown Point, Pt. 1, S.H. 891 Ticonderoga-Crown Point, Pt. 2, S.H. 1176 Crown Point-Port Henry, S.H. 841	14.42	Asphalt-concrete	$30,000 Plans $2	$540,000
Essex (Rte. 28N)	FARC 58-30	Aiden Lair-Newcomb, Pt. 2, S.H. 756 Newcomb-Long Lake, Pt. 1, S.H. 5188 Project S-210(3)	9.49	Asphalt Concrete = 9.49 Mi. Including Br. No. 1, Prestressed Conc. Beam 3 Spans 70' Ea. Br. No. 2, Reinf. Conc. Closed Box 25.5'	$115,000 Plans $10	$2,104,000
Rensselaer	FASS 58-6	West Sand Lake-Poestenkill-Cropseyville, Pt. 3 (County Road). Project S-486(2)	0.43	Asphalt Conc. = 0.39 Mi.; Misc. Work = 0.04 Mi. Incl. Br. No. 1 Pres. Conc. 2 Spans 49.8' Ea.	$12,000 Plans $2	$294,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, 1, New York						
Oneida (Rte. 69)	FARC 58-31	Whitesboro-Yorkville, Pt. 1, S.H. 8510 Project F-693(5)	1.92	Asph. Conc. Ty. 1A = 0.53 Mi.; Widen & Resurface = 1.39 Mi. Including Conc. Slab Br. 3 Spans, 22' Ea.	$56,000 Plans $3	$1,030,000
Herkimer, Madison & Oneida (Rtes. 5, 20, 12)	RC 58-22	Seven Various Highways in District No. 2	18.68	Subsealing Cement Concrete Pavt.	$18,000 Plans $2	$331,000
DISTRICT No. 3, E. E. Towlson, Acting District Engineer, 333 E. Washington St., Syracuse, New York						
Oswego	M 58-6	Oswego Grain Elevator and Terminal City of Oswego		Asph. Conc. Access Road	$450 Plans $10	$8,300
Tompkins	FAC 58-3	City of Ithaca Arterial: Meadow St., Seneca St., Green St. Project U-427(9)	1.35	Asph. Conc. Type 2A	$38,000 Plans $3	$680,000
Wayne (Rte. 21)	FARC 58-23	Marion-Williamson, Pt. 2, S.H. 1406 Project F-1140(1)	0.35	Asph. Conc. Type 1A = 0.31 Mi. Misc. Work = 0.04 Mi.	$5,000 Plans $2	$86,000
Wayne (Rte. 14)	FARC 58-25	Lyons-Sodus Point, Pts. 2 & 3, S.H. 1060 Project F-1145(1)	0.54 (0.12 Acc.)	Asph. Conc. Type 1A = 0.50 Mi. Misc. Work = 0.04 Mi.	$10,000 Plans $2	$182,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston & Ontario (Rte. 5 & 20)	FARC 58-29	Lima-East Bloomfield, Pt. 1, S.H. 5142 Lima-East Bloomfield, Pt. 2, S.H. 5041 Project F-343(14)	0.47	Asph. Conc. = 0.45 Mi.; Misc. Work = 0.02 Mi. Including Br. No. 1, Prestressed Conc. 2 Spans 70.2' Ea.	$28,000 Plans $2	$520,000
Monroe	FAC 58-6	Rochester City: Inner Loop (Front St. to North St.) Project U-1080(8)	0.63	Demolition	$12,000 Plans $2	$206,000
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Schuyler	FASS 58-12	Montour Falls-Townsend, C.R. No. 398 Project S-446(1)	1.60	Top Course Bit. Mac. Type 1	$16,000 Plans $2	$283,000
Steuben (Rte. 21)	FAC 58-4	Hornell City: West Main St. Project F-589(5)	0.31	Asph. Conc. = 0.31 Mi. Including Viaduct & Br. Repair Truss & Girders 840' Total Span	$30,000 Plans $3	$547,000
DISTRICT No. 7, Robert W. Sweet, District Engineer, 144 Van Duzee Street, Watertown, New York						
St. Lawrence (Rte. 56, 56A)	FARC 58-32	Norwood-Norfolk, S.H. 967 Norfolk-Raymondville, S.H. 1587 Project S-507(1)	0.29	9" Cem. Conc. Pavt. = 0.24 Mi.; Misc. Work = 0.05 Mi. Including Br. No. 1, Comp. I-Beam, 3 Spans, 240' Total Br. No. 2, I-Beam, Single Span 64'	$18,000 Plans $3	$328,000
St. Lawrence (Rte. 37C)	FARC 58-26	Massena-Helena, Pt. 2, S.H. 1265 Project S-367(2)	1.35	Asph. Conc. = 1.32 Mi.; Misc. Work = 0.03 Mi. Including Br. No. 1, Prestressed Conc. 4 Spans 75' Ea.	$30,000 Plans $3	$523,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Putnam (Rte. 6)	FGRC 58-24	Brewster-Carmel, S.H. 909 Project FG-500(3)	0.14	9" Cem. Conc. Pavt. = 0.14 Mi. Including R.R.G.S. (NYC RR) Plate Girder Single Span 103.6'	$19,000 Plans $2	$349,000
Ulster (Rte. 299)	FARC 58-33	Highland-New Paltz, S.H. 1536 Project F-1109(1)	5.10	9" Cem. Conc. Pavt. = 4.84 Mi.; Asph. Conc. = 0.26 Mi. Including Br. No. 1 Composite W.F. Beam 85' Span	$120,000 Plans $5	$2,152,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Schoharie (Rte. 30)	FARC 58-34	Grand Gorge-Breakabeen, Pt. 4, S.H. 8070 Middleburg-Breakabeen, S.H. 5577 Project S-459(3)	0.78 (0.06 Acc.)	Asph. Conc. = 0.78 Mi. Including Br. No. 2, Prestressed Conc. Single Span 72'	$20,000 Plans $2	$346,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	LP 58-1	Loop Parkway (Lido Blvd. at Long Beach to Meadowbrook State Parkway)	3.00 (0.17 Acc.)	Asph. Conc. = 2.63 Mi. Misc. Work = 0.37 Mi.	$40,000 Plans $3	$696,000
Suffolk (Rte. 27A)	FARC 58-27	Bayshore-Brookhaven Town Line, S.H. 5301 Project S-442(2)	0.97	Asph. Conc. = 0.86 Mi. Misc. Work = 0.11 Mi.	$29,000 Plans $2	$511,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON

SUPT. OF PUBLIC WORKS

Read the Official Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

EMPLOYMENT OPPORTUNITIES

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The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

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Subject to Agency Commission.

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$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

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Discount of 10% if full payment is made in advance for 4 consecutive insertions.

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Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36, N. Y. May 8th issue closes April 28th

ESTIMATOR

The young man we are looking for has had several years experience estimating for general contractors engaged in competitive building construction. He is ready or nearly ready to take over the job of chief estimator.

We have an exceptional opportunity to offer this man. We presently operate on a nationwide basis, but plan to expand our operations especially throughout the mid and far western states. We can offer a key position in this expansion program and an opportunity to grow with a growing company.

Write full details covering experience, education, references, salary and personal data.

Blount Brothers Construction Company
P. O. Box 949 Montgomery, Alabama

CONSTRUCTION MANAGER AVAILABLE

20 years experience in building construction. Can take complete charge of all operations. Have proven record with good references. Foreign and domestic experience. Would be well qualified to manage branch office in SW USA for large construction firm. Presently employed but can be available in reasonable length of time. Can be available for personal interview.

PW-7711, Engineering News-Record
68 Post St., San Francisco 4, Calif.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Wanted—Field Engineer, Estimator. Excellent opportunity for advancement in well established growing General Contracting firm Poughkeepsie area. Salary open. P-7693, Engineering News-Record.

Civil-Sanitary Sales Engineers needed by manufacturer of major water, sewage and waste treatment equipment serving entire U. S. Experienced preferred. Location: Midwest, Pacific Coast and Southeast. Salary open plus commission. Send experience resume. P-7717, Engineering News-Record.

WANTED: Qualified Reinforcing Steel Estimator required by Fabricator. Good Opportunity for advancement. Brocker Mfg. & Supply Co., York, Pennsylvania.

Wanted — Construction Superintendents — Long established Mid-West General Construction firm has openings for two or more qualified field construction superintendents. Engineering background preferred but not required. Applicants should be aggressive, cost conscious and well grounded in reinforced concrete, structural steel, and masonry structures. Complete education, experience data and salary expected should be furnished in first reply. P-7751, Engineering News-Record.

Hydraulic Engineer. Graduate hydraulic engineer, 30-40, with five or more years in flood control. Will assist in the preparation of technical literature on dams, flood control, culvert and drainage structures. Position involves inspection of projects under construction and assistance to field forces in promoting concrete. Must have good personality and ability to write and speak in public. Salary open. Location, Chicago P-7596, Engineering News-Record.

Civil Engineer to handle technical phases of producing concrete for a Ready Mix Dealer and Paving Contractor. W. Kent, P. O. Box 560, Champaign, Illinois.

POSITIONS VACANT

Wanted—Construction Superintendent and Foreman. Must be experienced on reinforced concrete and pipe lines in Sewerage Construction. Please send resume including education, work history and salary. Requirements sent to P-7450, Engineering News-Record.

Superintendent Wanted for road construction. Rieth-Riley Construction Co., Inc., P. O. Box 477, Goshen, Indiana.

Wanted: Good Land Surveyor, good opportunity for right man. Steady work. Inquire by letter or personal appointment Saturday mornings to: Howard Madison, Engineer & Land Surveyor, 40 Hoy Ave., Fords, N. J. (Tel. HI 2-3373).

Structural Engineer, Sanitary Engineer, Highway Design Engineer experienced in Interchange Geometrics, & Party Chief by Consultant in Midwest University City. Send resume of experience in first letter. P-7825, Engineering News-Record.

Materials Engineer, for establishing and operating Testing Laboratory in Far East; 40 to 55; graduate engineer; 5 years field and 10 years modern state highway laboratory experience or equivalent; 9 month assignment; $1,167 per month plus expenses, single status. P-7826, Engineering News-Record.

POSITIONS WANTED

Construction Supt 22 years experience all phases highway work. PW-7658, Engineering News-Record.

Purchasing—Well rounded experience in procurement for heavy construction and general contracting, good administrator and able to handle sub-contractor. PW-7663, Engineering News-Record.

Soils & materials engineer; M.S(Soil Mech.) & M.S(Highwy. Engg.); about ten years design office & field experience; special experience in soils and foundations; regd. P.E.; present emoluments about $10,000 annual; single; 39; available April, any location. PW-7672, Engineering News-Record.

Archt.—Struct. Engr. exp. design, supv., estimating of indust., commer., munic., constr., desires position with archt., engr., constructor. PW-7686, Engineering News-Record.

P.A. If your job size justifies and policy permits Field Purch. Dept. including Subcontracts I offer unimpeachable background ethics & ability. PW-7699, Engineering News-Record.

POSITIONS WANTED

Engineering Executive. Heavy industrial and civil experience; all phases of administration and management. Organize and direct large design jobs or work in consulting and exec. asst. capacities. Proposals, reports, contracts, liaison. P.E. in 3 States; NBER Certificate. PW-7748, Engineering News-Record.

2 Civil Engineers (grad. 1944) w. extensive experience in estimating, letting of sub-contracts, field supervision of multi-million dollar projects—desire to establish Division-office for General Building Contractor under a percentage of net-profit basis. PW-7743, Engineering News-Record.

Engineer-Estimator-Asst. Project Mgr. Hvy Const. Experience wants permanent connection with reliable General Contractor New York—Connecticut area. Presently employed. PW-7749, Engineering News-Record.

Surveyor—Engineering Aide—Overseas 3 yrs experience surveying & Eng. Aide, 27 yrs old. Military service completed. Will travel anywhere. Now employed party chief & engineering Aide central Ohio pop 35,000. Non graduate, experience only. PW-7750, Engineering News-Record.

Soils Engineer 26 MCE registered, experienced in design, analysis, testing and borings, some travel O.K. PW-7736, Engineering News-Record.

Wanted job as project manager or superintendent of highway or throughway project, dirt or earth preferred, am capable, willing and available now. Can furnish references, also prove my capability, and will go any place. PW-7726, Engineering News-Record.

Sewer and Paving foreman sewers, grading and paving, concrete, asphalt. PW-7733, Engineering News-Record.

Civil Engineer, Registered, Member A.S.C.E., over 20 years experience in Highway and Expressway Design, 10 years in responsible positions, interested in making connection with consulting firm. Salary and location open. PW-7732, Engineering News-Record.

Structural engineer, 25 years experience design and supervision of design. PW-7729, Engineering News-Record.

Civil Engineer, M.ASCE, 62, degrees, state licenses; 35 years experience; design, construction, and administration; bridges, parkways, thruways, airports, harbor works, railroads, underpinning and foundations. PW-7753, Engineering News-Record.

(Continued on page 128)

ROAD CONSTRUCTION ENGINEER

Asphalt

Graduate engineer with minimum 7 years experience in road construction using liquid asphalt. Some knowledge of manufacturing helpful. To serve as technical advisor to company, government, road contractors and builders in Saudi Arabia.

High salary plus liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor Box 213

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

ENGINEERS AND MANAGERS

General contractor will add to expanding organization, men qualified for large projects overseas and domestic, experienced in supervision of construction, maintenance and operation of military installations.

This will include men with professional engineering and management experience in airports, power, water, sewage, structures, pavement and grounds, construction and administrative type vehicles, fire and crash rescue and food service operations.

Experience in the Airforce installation engineering field or Army post engineering field, and military vehicle administration or military mess operation are desirable.

In reply include education, age, experience, salary requirement, and state overseas area willing to relocate in your resume. The completeness of your resume will qualify you for an interview. All replies to be held in strict confidence.

P-7709, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

GENERAL SUPERINTENDENT FOR HEAVY CONSTRUCTION DIVISION

Excellent opportunity for man capable of supervising heavy construction projects at various locations throughout the South. Type of work normally includes bridges, pile driving operations, dock construction, dam construction, and sewerage treatment plants. This position requires an executive who is qualified and experienced to supervise all field construction and assist in preparation of bids. Write fully, giving education, past experience, references, availability, salary requirements, and personal data to

Blount Brother Construction Company
Post Office Box 949
Montgomery, Alabama
Attention:
Heavy Construction Division

HIGHWAY ENGINEERS — IRAQ

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POSITIONS WANTED
(Continued from page 126)

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Const Supt. 35, engineering background. 12 yrs exp. on bridges, disposal plants, industrial & commercial buildings. Exp also-estimating, detailing, scheduling, cost distribution. Prefer N.J. or Del. area. PW-7793, Engineering News-Record.

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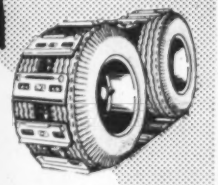

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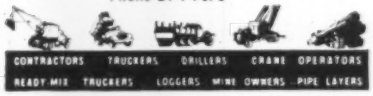

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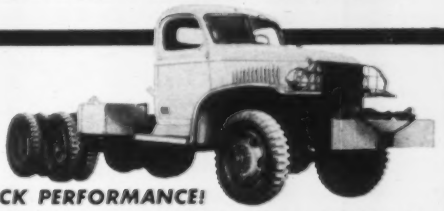

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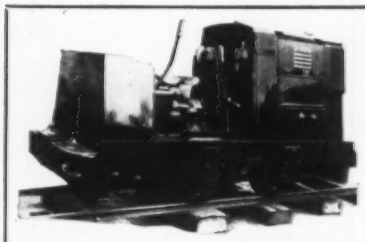

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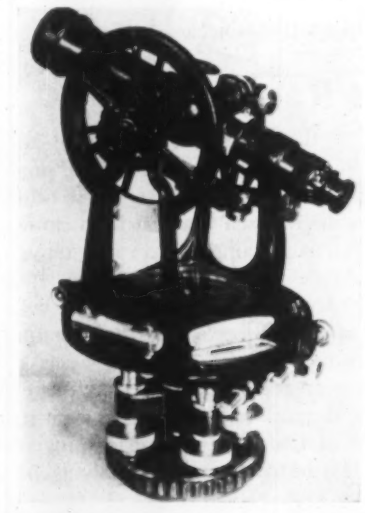

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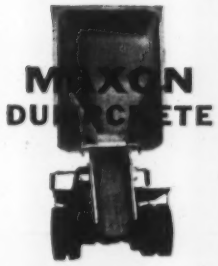

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Editorials

Capitol Deception

EDITORIALS published recently in newspapers and magazines to persuade Congress to halt the proposed reconstruction of the east front of the U.S. Capitol are doing a disservice to Congress and the public. Editors appear to have been deceived by a small vociferous group of architects whose motives in this campaign are questionable. The latest example is an editorial in the April 14 issue of LIFE, which grossly distorts the facts.

The LIFE editorial is particularly disturbing because it encourages false conclusions by innuendo. Consider the title: "Congress, Spare Our Capitol." This implies Congress is all set to destroy our national heritage. Later on, the editorial points out that Speaker of the House Sam Rayburn is one of the leaders in the plot. The fact is that the reconstruction was proposed in 1863 by Thomas U. Walter, Architect of the Capitol, who designed the present dome. And it has been recommended by every Architect of the Capitol and every consulting architect who studied and reported on the problem since.

To create the impression that the reconstruction will be unnecessarily costly, the LIFE editorial gives exaggerated cost figures. It states that cost of the 32½ ft eastward extension is "officially estimated at $135 a square foot, but responsible architects fear it would exceed $300." Actually, the objectives of the east-front shift are not only to gain space needed by Congress in the Capitol but also to preserve the original wall design in marble and to move the wall into proper relationship to the dome, as intended by designer Thomas Walter. There has been no official cost estimate of $135 per sq ft, to our knowledge. Moreover, dividing the total cost of the project by the floor area in the extension, as appears to have been done to get this figure, actually is meaningless: If the wall were shifted 100 ft, the cost per square foot might be only about $50, whereas if it were moved a fraction of a foot, this unit cost might be in the millions.

On the other hand, duplicating the wall 32½ ft to the east will be expensive—estimated cost, about $4 million. But the present sandstone front is in bad shape, though it has been given 35 coats of paint in a futile effort to preserve it (ENR Mar. 27, p. 100). Consultants who have examined the wall and foundations report that it would cost more to repair them than to build a new wall in more durable marble, which would harmonize with the marble House and Senate wings.

In its emotional appeal, the LIFE editorial then glibly states, "Presidents since 1817 have sworn their inaugural oaths beneath its graceful Federal columns." Aside from the fact that 18 Presidential inaugurals were not held there, the implication that the reconstruction would destroy the beauty of the front is false, since the intent actually is to preserve the original detail, which is now being lost by erosion.

It is true that the American Institute of Architects, in convention assembled, passed a resolution opposing the east-front shift. However, the membership of the AIA is divided on this matter, with nearly all who are noted for achievements in classical architecture recommending reconstruction on the east. It is particularly noteworthy that after the executive director of the AIA presented the resolution to a Senate committee, he disclosed that it conflicted with the position of the AIA Committee on the National Capital and his own beliefs.

To those who are close to the situation, it appears that some of the architects constituting the opposition are not as concerned with preserving classical architecture as they seem to be. They are opposed to J. George Stewart, who now has the title of Architect of the Capitol. Mr. Stewart is an engineer. They would like to replace him with an architect, though the duties of the position at present actually are those of a superintendent of grounds. They cannot find legitimate reasons for his removal, hence they have seized the issue of the proposed reconstruction to discredit him.

Unfortunately, misinformation calculated to raise emotions to a high pitch has been widely disseminated and has encouraged appeals to Congress to halt the work on the east front. It is to be hoped that Congress will recognize the false premises on which the opposition is based and act to speed the project.

Waterworks Research

FEW WILL ARGUE with the conclusion that basic and applied research are indispensable ingredients of progress in any technical field. In waterworks, as in other industries, the bulk of the research load has been carried by equipment and materials manufacturers and university and governmental-type research organizations. It is only recently that the efforts of these agencies have been supplemented to any appreciable extent by the operating segment of the waterworks industry.

There is room for a great deal more research effort by the water suppliers themselves. Few can be expected to duplicate the City of Chicago's exemplary program (ENR Apr. 17, p. 124); but every water supply agency might be expected to help carry the search for new knowledge within the limits of its ability. Admittedly, it is not easy to allocate manpower or money to anything not directly connected with day to day water supply operations. Yet, a modicum of practical research can be justified economically in many instances, and the annual research expenditure would be relatively small.

It would be logical for the American Water Works Association through its local sections to encourage and coordinate such operator-level research. All concerned might be pleasantly surprised at the results in terms of a more rapidly advancing industry.

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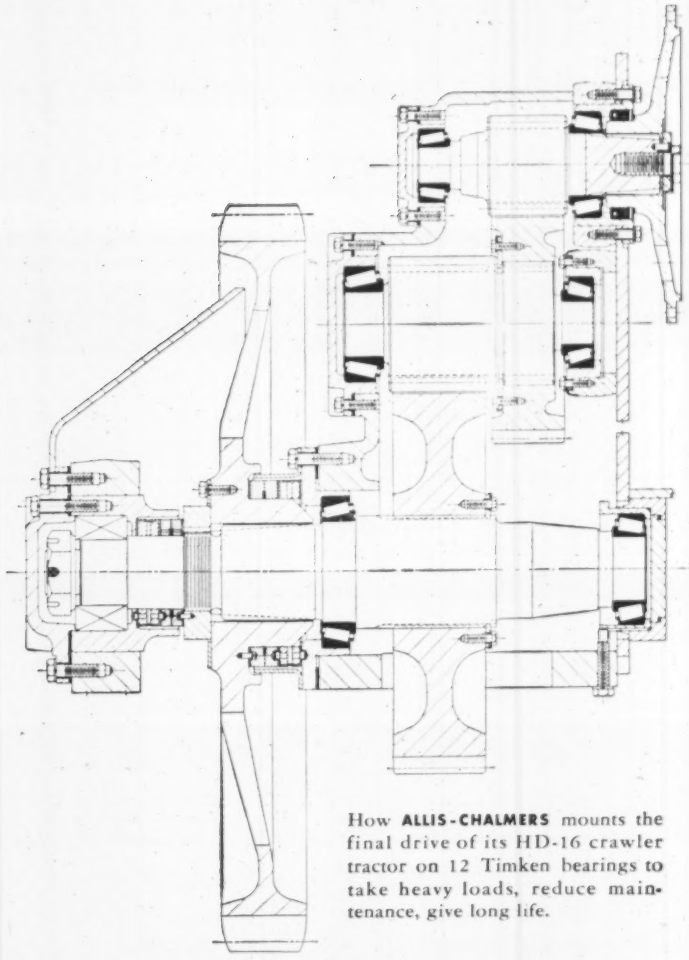

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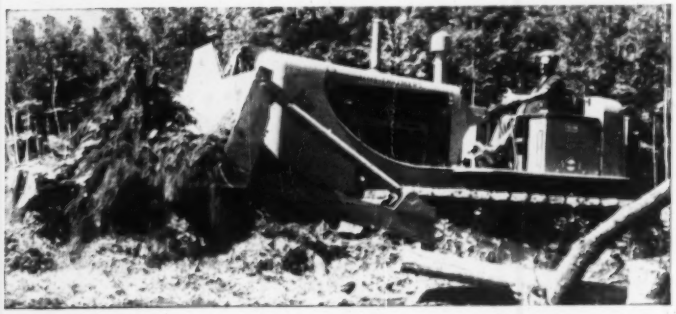

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